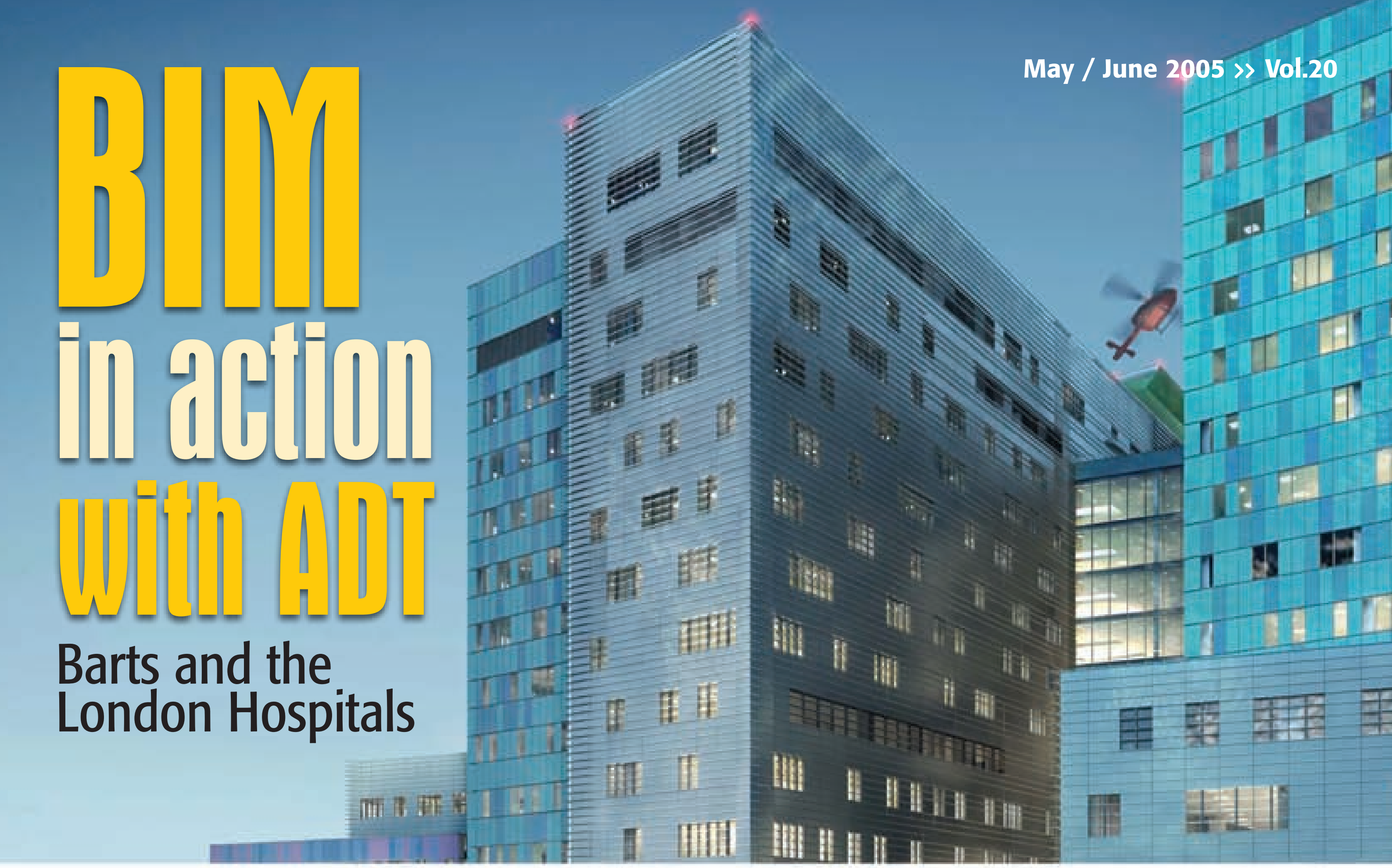
May / June 2005 >> Vol.20



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AEC MAGAZINE

DESIGN, MANAGEMENT & COLLABORATION IN THE BUILT ENVIRONMENT



Allplan 2005

The latest architectural update from Nemetschek

Adobe policy server – Managing PDFs inside your company and beyond



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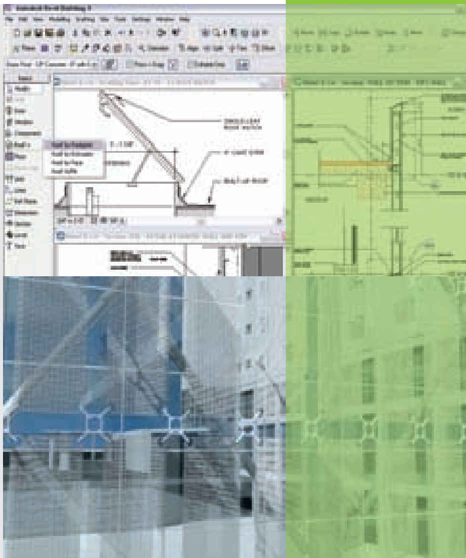
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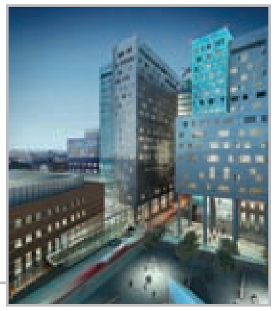
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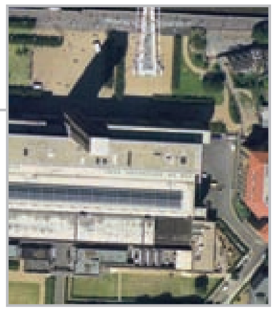
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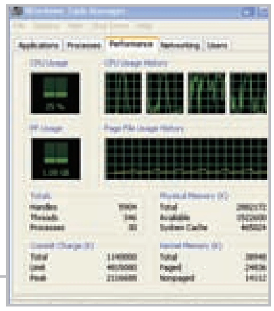
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Microsoft ships Windows XP x64



AFTER MONTHS OF WAITING, Microsoft has finally started shipping a 64-bit version of its Windows Operating System. Windows XP Professional x64 Edition, however, will initially only be available through OEMs and is not currently available as a retail product. One of the reasons behind this 'gradual' release to market may be down to drivers. XP Professional x64 Edition requires 64-bit hardware drivers (32-bit drivers are not supported), so hardware manufacturers will have to write new 64-bit drivers to get their components to work with the new OS. Furthermore, components such as graphics cards, may not yet work at the same performance levels as when running on 32-bit Windows XP; stability is always the primary consideration, with performance coming later.

With this in mind, it's unlikely that CAD users will migrate to the new Operating Systems en masse. However, the ability for Windows XP Professional x64 Edition to address 4GB RAM per process when running 32-bit applications is sure to represent a sizable carrot for many high-end users, and more may follow when CAD vendors start to ship 64-bit versions of their CAD software which will be able to address virtually unlimited amounts of memory.

To help ease the transition, Microsoft has launched the Windows XP Professional x64 Edition Technology Advancement Program, which enables customers who have purchased Windows XP Professional (32-bit) to exchange it for Windows XP Professional x64 Edition.

Orders for the Technology Advancement Program must be placed by July 31, 2005, and it should be noted that Windows XP Professional x64 Edition currently requires a "clean installation," meaning the contents of your hard drive will be erased during the installation, so be warned!

Windows XP Professional x64 Edition will only be able to run on chips from Intel and AMD that have added 64-bit instructions: EM64T-based Pentium and Xeon processors in the case of Intel and AMD64-based Opteron and Athlon chips from AMD.

Meanwhile, Microsoft's next generation OS, codenamed Longhorn, is set to ship in 2006, and will be available in both 32-bit and 64-bit versions.

Look out for more on Windows XP Professional x64 Edition in the coming months.

www.microsoft.com/x64

AMD and Intel deliver dual core processors

AMD AND INTEL have begun rolling out their dual core chips, which build in two processing cores, in effect giving you two CPUs in one piece of silicon. As with current dual processor workstations, dual core machines will benefit those most who work with multi-threaded applications or multiple applications.

AMD's initial dual core strategy is to deliver dual core Opteron processors - meaning workstations like HP's xw9300 will have four processors in a single machine. Intel, on the other hand is first concentrating on the dual core, single processor market with a dual core version of the Pentium Processor Extreme Edition.

Interestingly, the launch speeds for both AMD's and Intel's dual core chips are slower than both manufacturers' current flagship single core chips. AMD's fastest current dual core Opteron, the 275, runs at 2.2GHz, compared to its single core 2.6GHz 252 processor. Intel's Pentium Processor Extreme Edition 840 runs at 3.2 GHz, whereas its top end Pentium 4 runs at 3.8GHz. As a result, the first generation dual core processors will run single threaded applications slower than on both manufacturers' single core processors. Meanwhile, for more on dual core processors from AMD and Intel, turn to page 33.

www.amd.com / www.intel.com

HP unveils two new compact printers

HP has announced two new compact DesignJet models for the CAD/GIS markets, the HP Designjet 70 and HP Designjet 110plus. The A2+ Designjet 70 printer is designed for architects, engineers and designers who need an affordable and versatile colour printer to produce high quality line drawings, renders, check and final plots. The HP Designjet 110plus Printer, features new roll feed capability for technical design professionals who need to print on variety of media up to 625 mm wide and over 45 m long. Its versatile printing allows for use of a wide range of media types up to 0.4 mm thick and 300 g/m2, and prints sizes up to A1+. The DesignJet 70 is available immediately for £730, while the Designjet 110plus will set you back £935.

www.hp.com/designjet

Peak achievement for CARE



A record-breaking thirty eight teams of five walkers apiece, from twenty seven companies in the construction industry, left the comfort of their offices and took to the mountains last month to complete the third COINS Three Peaks Challenge. This fundraising event for CARE International has also broken previous fundraising records, with £251,500 already pledged for the agency's overseas work. CARE International is an international relief and development agency working with impoverished communities in about 70 countries worldwide, reaching over 35 million people every year.

www.challengeseries.org.uk
www.coins-global.com

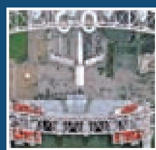
Somerfield extends Buzzsaw



The Somerfield Group has chosen Autodesk's Buzzsaw online project collaboration service to help manage and control an ambitious rolling programme of 300 new refurbishment and development projects a year. Among the predicted benefits is a 50% reduction in printing and photocopying costs, significant savings on travel and, importantly, through the elimination of planning and construction errors attributable to outdated information.

www.autodesk.co.uk

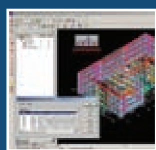
Ultra-high resolution maps



BlueSky has begun photographing large parts of the country from the air as part of a highly detailed aerial survey. The company has won a host of new contracts to create ultra-high resolution digital photomaps for councils nationwide with detail in some areas of up to 5cm pixel resolution.

www.bluesky-world.com

New AutoVue pricing

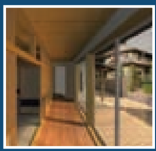


Allied Images has announced new pricing for Cimmetry Systems' AutoVue software product line, which gives users the ability open and view some 200+ native 2D CAD and Office formats. Prices have been reduced by up to 20% across the entire product line and starts at £255 for a single seat.

www.allied-images.com

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ArchiCAD centre merger



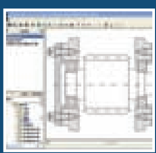
Bite Design - the longest established ArchiCAD Solution Centre with over 12 years product experience - has merged with The ArchiCAD Centre to become the largest provider of ArchiCAD solutions in the UK. Retaining the name Bite Design, clients of the new company will benefit from improved facilities at four offices across the UK in London, Nottingham, Cambridge and Newmarket. ***www.bite.co.uk***

VectorWorks set for tiger



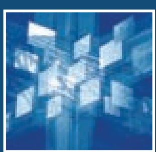
Nemetschek NA has announced that VectorWorks 11.5 is fully compatible with Apple's latest operating system, 10.4 or "Tiger." Nemetschek NA engineers were pleased to see speed improvements in VectorWorks and feel that VectorWorks users will benefit by the new technology Tiger has to offer. ***www.nemetschek.net***

UK debut for viewing tools



Second Source has signed an agreement with Kamel Software of Florida to market FastLook and WebLook products in the UK. FastLook is a Windows application that enables the user to view, interrogate, print and redline CAD and non-CAD files. FastLook supports over 200 different file formats. WebLook is designed for sharing drawings with suppliers, customers and offsite personnel in a fast, secure and low-maintenance manner. WebLook is designed for Internet, Intranet and Extranet solutions. ***www.secondsourceuk.com***

Tekla Structures 11



Tekla, a provider of 3D modelling software for the construction industry, has launched a new version of Tekla Structures. Tekla Structures is an integrated 3D solution that covers the entire structural design process, from conceptual design to detailing, fabrication and erection. The same model can be utilised for producing analysis & design results, drawings and reports. Hence steel, concrete and structural design professionals can work with the same shared, always up-to-date model throughout every stage of a building project say the developers. ***www.tekla.co.uk***

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Apple to move to Intel processors

After weeks of mounting speculation, Apple has announced that it is to switch from the PowerPC chips currently used in its line of Macintosh computers to Intel processors.

Apple CEO Steve Jobs announced the move at the recent World Wide Developer's Conference by demonstrating the firm's latest Operating System running on a Pentium 4-based Mac. Jobs pinpointed power consumption and performance as the driving force behind the transition: "When we look at the future road maps projected out in mid-2006 and beyond, what we see is the PowerPC gives us 15 units of performance per watt, but the Intel road map in the future gives us 70."

Jobs also mentioned Apple's continuing inability to shoehorn the powerful but hot-running G5 chip used in its desktop computers into their laptops. The performance of the G4 processor currently used in PowerBooks has suffered in comparison to recent Pentium M-based laptops running Windows.

The transition will require developers to recompile, and in many cases rewrite portions their applications for the new processor architecture. Existing PowerPC software will still run on the new Macs, albeit at a reduced speed, under the Rosetta emulation environment.

Developer reaction was largely positive, with both Adobe and Microsoft announcing support for the new platform. Maxon, authors of 3D package Cinema 4D, revealed that they had already compiled a version of the software for Intel-based Macs.

Despite the move to Intel, Apple stated that it currently has no intention of releasing a version of OS X that can be installed on other makes of PC. The company will not, however, prevent the installation of Windows on x86 Macs, opening the path for users to run both Windows and OS X in a dual-boot configuration. Look out for more on this development next issue. ***www.apple.com/uk***

Structural steel upgrade

AceCad has recently released a substantial upgrade "v11" to StruCad, its 3D solid modelling system used for the detailing of structural steel buildings. According to its developers, the new version contains a range of improvements designed to significantly increase the power of StruCad, its ease of use and its flexibility to meet the users' requirements.

In v11 there is no limit on the number of members/joints/fittings/attributes/bolt groups etc allowing large projects to be completed with one model. Previously several models were required with additional effort to connect them.

An estimating system has also been included for the first time allowing users to produce fast and accurate estimates, and the Graphical User Interface has been completely rewritten to provide greater customisation and ease of use.

Communications to other systems has been significantly enhanced with the ability to XFEF external drawings (in SPF and DXF formats) in StruCad's 2D and 3D environments. CIS/2 analysis and fabrication import and export added along with improvements to links to analysis and design systems such as Staad.

StruCad outputs high quality, accurate shop drawings (GAs, fabrication drawings, fittings drawings, assembly drawings, 3D views and cutting templates), material lists and CAM data for CNC machines. ***www.acecad.co.uk***

MicroGDS 9.0 announced

Informatix Software has unveiled version 9.0 of its MicroGDS 2D and 3D CAD software. MicroGDS 9.0 introduces a new Properties Window which allows object properties to be displayed and directly edited. The Properties Window displays both internal properties such as linestyle or colour, and user-defined attributes such as part number or manufacturer. A new capability to define data schemas helps to create and manage attribute data.

The MicroGDS data model now includes "assemblies". An assembly is a collection of objects which behaves like a single object in the user interface yet retains the identity of its constituent objects. Assemblies can be nested, and referenced directly from library files, providing a tool with which to build reusable components.

The quality of text creation and presentation has been improved with a much wider range of facilities for handling font characteristics and line wrapping. Translation to and from other formats, notably AutoCAD DWG, has been further enhanced, and updated for AutoCAD 2006. MicroGDS 9.0 also features "guide lines" which are generated automatically to assist positioning relative to existing graphics. Other improvements to snapping and co-ordinate input are designed to make precise construction even easier. ***www.informatix.co.uk***

Excitech and Aztec CAD merge

Leading UK CAD solution and services suppliers Excitech and Aztec CAD are combining forces. Under the name of Excitech, they will maintain their office locations in Enfield, Middlesex as a head office as well as additional offices and training locations in central London and Bristol. Both companies provide CAD solutions and services as well as complete IT system commissioning and support. ***www.excitech.co.uk***

NavisWorks JetStream v4.1



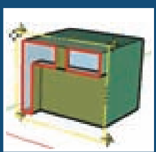
NavisWorks, the developer of interactive viewing technology and the 3D CAD review solution has announced the release of the latest version of NavisWorks JetStream, v4.1. This first NavisWorks JetStream point release offers increased support for Autodesk products plus additional file format enhancements, full localisation for German, Chinese, Japanese, and a new French GUI. ***www.navisworks.co.uk***

DWF/DWG boost for Oce



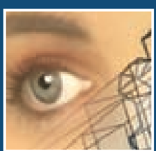
Océ has optimised support for printing from Autodesk products including AutoCAD 2006 software and Autodesk DWF Viewer and DWF Composer with the new Océ Windows Printer Driver 1.9. According to the company, the Océ Windows Printer Driver 1.9 has been optimised in close collaboration with Autodesk's development teams to produce high-quality and fast printouts, especially when printing design data directly from AutoCAD 2006. ***www.oce.com***

HKS invests in SketchUp



@Last Software has revealed that HKS, a top-ten US architectural firm headquartered in Dallas, Texas, has signed a company-wide agreement to purchase 3D conceptual design software, SketchUp. 'We have been using SketchUp for a couple of years now and have come to appreciate the flexibility this application gives us to study and present design concepts. So many of our employees have asked to have SketchUp that we realised it was becoming a standard tool for our designers,' says Davis Chauviere, Chief Information Officer at HKS in Dallas. ***www.sketchup.com***

RxView/RxHighlight R7.1



Rasterex has announced the release of version R7.1 of RxView and RxHighlight. RxView allows users to view & print more than 250 different file formats (2D & 3D CAD, plot-files, PDF files, Office documents, raster images etc.). RxHighlight adds advanced functions like mark-up, file conversion, batch printing, batch conversion and text search & extraction. ***www.rasterex.com***

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Frank Lloyd Wright house re-born



A Frank Lloyd Wright house, designed more than 50 years ago, is now fully modelled and documented in ArchiCAD, and the building itself is under construction.

Architect Thomas Heinz, AIA, a renowned Frank Lloyd Wright scholar and leading authority on Frank Lloyd Wright designs, was selected as the architect to model the house based on five sketches drafted with pencil and paper by Wright. The original client had hired Wright to design a home on a remote, private island in New York, but ultimately chose a different scheme on an alternative site nearby. When the new client, who revitalised this project, approached Heinz, the Architect realised he needed a tool that would allow him to model the complete, original design set and visually communicate Wright's design intent.

"Frank Lloyd Wright had sketched the floor plan and identified each room and its location, but other than that, there were no other details available for reference. The virtual model I was able to develop using ArchiCAD enabled me to share the design in a clear format that both the homeowner and contractor could easily understand," said Heinz.

Where most of Wright's later, Usonian residences are structured to follow a rectangular/square grid, this home was based on a triangular form, with walls at either 60 or 120-degree angles. The building's site also played a strong role in the layout of the plans. A 60-foot rock, known in the project as the Whale Rock, forms a wall in the entrance of the building, separating the kitchen from the utility room. In addition, part of the roof rests upon the Whale Rock. ArchiCAD allowed Heinz the flexibility to work with these challenges, following through on the designs as Wright intended.

"Other programs don't understand how a building will actually stand up in its environment. With designs developed in the ArchiCAD Virtual Building model, you can really get the full feel and dimensions of the space. This became very important in the review and approval processes. We sped through approvals because everyone could immediately see what the building would look like, inside and out," added Heinz.

This project is of great architectural significance; a Frank Lloyd Wright-designed house has not been built on its original site since the early 1960s. As the current client wanted to truly reflect Wright's intentions, the house, 50 years after its initial inception, is finally under construction, and precisely mirrors Wright's sketches. ***www.graphisoft.co.uk***

Autodesk gives Revit structural angle

Autodesk has introduced Autodesk Revit Structure, a new structural engineering software product that offers concurrent modelling for design, analysis, coordination, and documentation. Built on the Autodesk Revit platform, a technology foundation for building information modelling (BIM), Autodesk Revit Structure enables engineers to realize their ideas in a single building information model.

Autodesk Revit Structure is designed to help structural engineers improve accuracy of designs and documentation with bi-directional linking to industry-leading analysis software; collaborate better with direct links to architectural models; and ensure design and documentation are always coordinated, consistent, and complete with Revit parametric change management.

Autodesk Revit Structure is currently only available in the United States and Canada and there is no confirmed date as to when it will be available in the UK. ***www.autodesk.com***

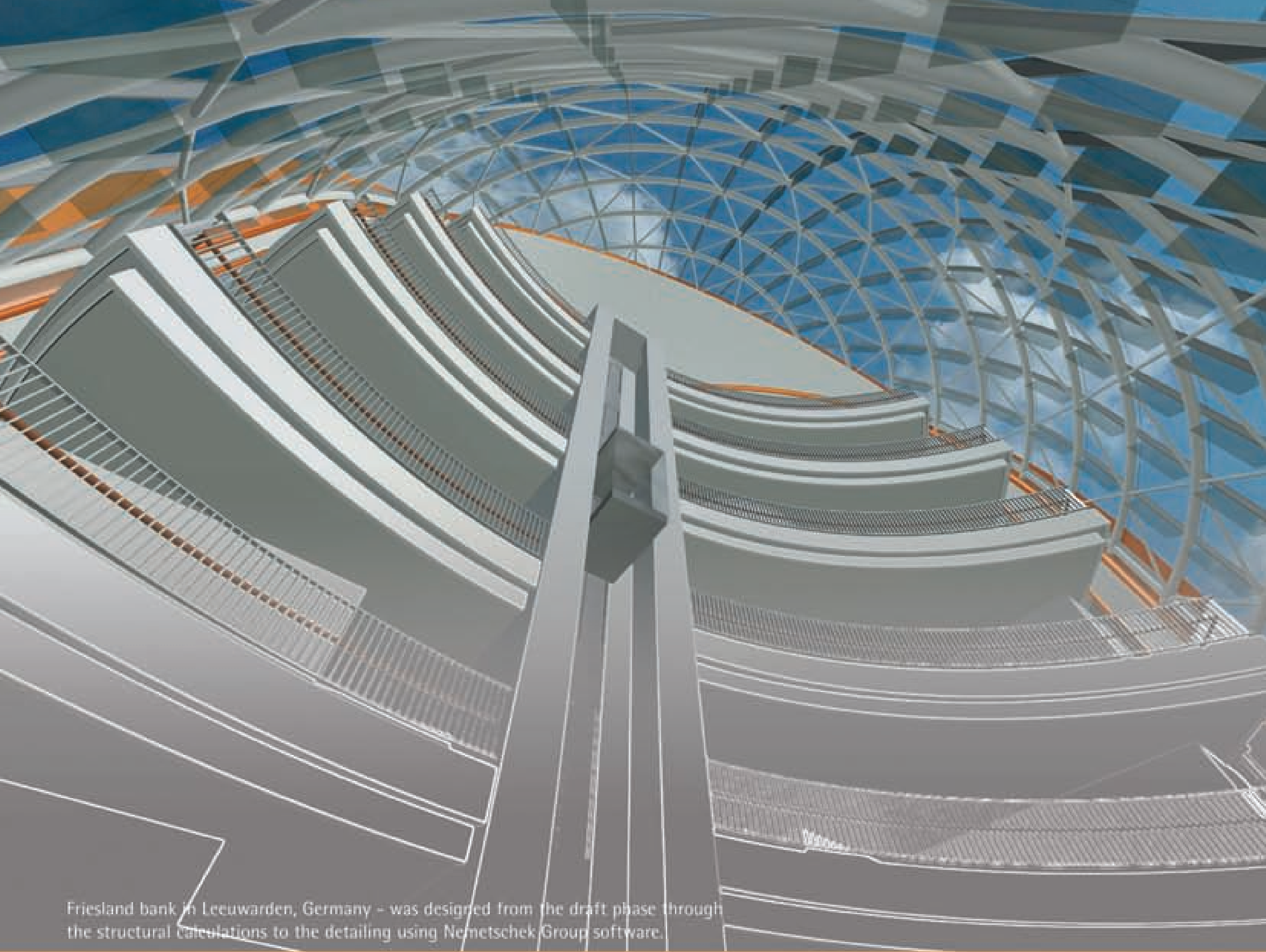
SOM builds on Revit for Freedom Tower

Autodesk has announced that Skidmore, Owings & Merrill LLP (SOM) has standardised on Autodesk Revit for the Freedom Tower project, the first commercial building to rise on the former World Trade Center site in New York City.

The entire core design team, including project engineers, Cantor Seinuk Group (CSG) and Jaros Baum & Bolles, Inc (JB&B), are collaborating within the Revit model. SOM's use of Revit Building expanded from the complex sub-grade levels of the building to the entire project, which includes the tower's lower and main core, enclosure, structure and cable-net. In addition to using Revit Building, SOM is also relying on the Autodesk Buzzsaw service to create, manage and share the vast amount of digital design data required for the Freedom Tower project, and it is working with Autodesk Consulting for software implementation and training. ***www.autodesk.co.uk***


Whatever the input


We take care of the output



Friesland bank in Leeuwarden, Germany – was designed from the draft phase through the structural calculations to the detailing using Nemetschek Group software.

Allplan 2005

Greg Corke

For the 2005 release of Allplan, Nemetschek has paid much attention to ease of use, featuring many AutoCAD-like commands. This month Greg Corke takes a look at the core and architectural modules in the multi-disciplinary AEC solution.

Product: Allplan 2005 **Supplier:** Nemetschek **Price:** On application

To my mind, Allplan from Nemetschek has never been the easiest to use of the many architectural-focussed CAD packages. Long-term proponents of the multi-disciplinary AEC system may well disagree with this statement, but for someone who spent their formative CAD years growing up with AutoCAD, Allplan's command structure has always seemed a little alien.

Taking direction from industry leaders is nothing new, so it came as little surprise to find that the developer of Allplan has introduced a range of 'AutoCAD like' functionality into its latest version. In acknowledgement that there are many CAD literate architects and engineers out there that also cut their teeth on AutoCAD, Allplan 2005 includes many enhancements and additions to the existing commands that are actively described as 'AutoCAD-like'.

In Allplan 2005 users can now select elements prior to executing a command. They can also select elements based on the direction in which you enter the selection rectangle. In short, draw a window around a group of elements from left to right and Allplan will now select everything that's fully inside the rectangle; draw a window from right to left and everything that's inside and crosses the rectangle will be selected.

Allplan 2005 also has more intelligent sketching, and users can now easily set up numerical offsets and angles on the fly, constrain in X, Y directions, and use enhanced snap points, all controlled by a combination of right clicking, a new dynamic toolbar and dialog line. Handles have also been revised and improved for elements to enable much more flexibility when moving, stretching and resizing objects.

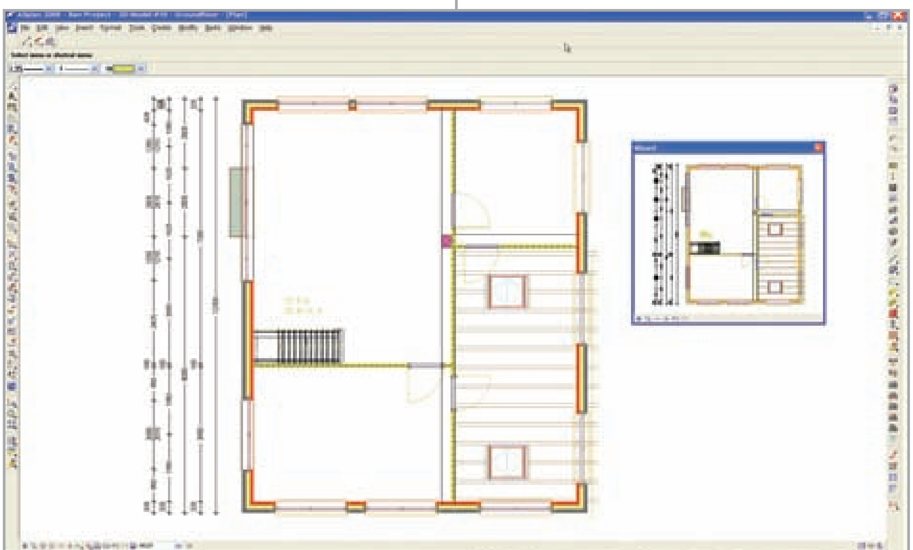
While all of these enhancements to the core tools should be immediately recognisable to the AutoCAD user, they should also make the system much more flexible, regardless of background. Indeed a complete overhaul of the dimensioning lines module does just that.

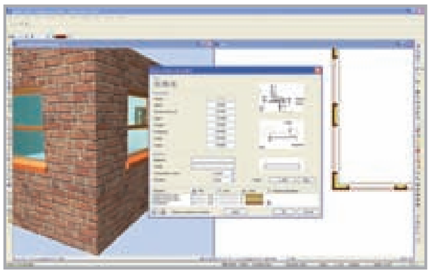
Now dimension lines are always created as an associative dimension, and a new 'direct dimensioning' tool will automatically dimension an entire feature. For example, users need only select two points on a wall and then place a dimension line which takes in all the elements of that wall. Should additional elements, such as a window, be added or existing elements removed, then with a few clicks the dimensioning line is amended and automatically recalculated. N.B. This new feature has not been implemented at the expense of the automatic wall dimensioning tool with its associative dimensioning. The associative dimensioning has the additional benefit that should any part of the wall move or its size change, then the dimensions will automatically update.

In addition to a number of other dimensioning enhancements, Nemetschek has created a separate function for 'setting out' (or pegging out in Allplan speak) – simply select the start and end point of the setting out line, and then click on each individual point to automatically create the perpendiculars complete with chainage.

Revision clouds is another new feature for Allplan 2005, which allows users to highlight changes made to drawing files or layouts. These can then be viewed and redlined by non-technical staff with a separate Allplan viewer, which is not free like some CAD viewers.

While Wizards isn't a new addition to Allplan 2005 (was introduced with Allplan 2004) it's still worth a mention due to its ease of use and ability to help new users up to speed.





Window Sills can now be easily created in a similar way to doors and windows using Smart Symbols.

The Wizard is a small window, which is displayed in the workspace and includes a pictogram-like key representing frequently used tools. It's a bit like a toolbar, but its actual geometry rather than an icon represents each command. All you need to do is click an element with the right mouse button and select a tool on the Shortcut menu. When you double-click with the right mouse button, the parameters of the element are copied.

As opposed to a 'normal' Allplan window, you cannot draw in a Wizard window. But you can use the icons in the lower border of the viewport for controlling the display on screen. The Wizard window has the Always on Top property and cannot be maximized or minimized, although its size is variable.

Several predefined Wizard files are provided with the program. In addition, you can create your own Wizards, and these can be ideal for guiding users through specific design processes, particularly if there is a variation on a theme. For example, an architect working on roof design could set up a Wizard exclusively for this purpose, complete with commonly used dimensions/spacings.

Working with files

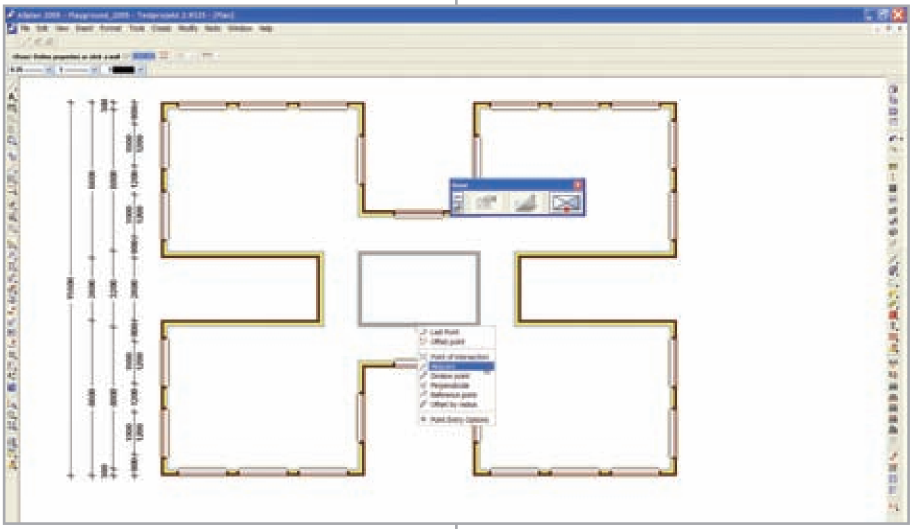
Nemetschek has introduced a new file format for the new release called NDW. Prior to Allplan 2005, users were only able to manage, save and copy Allplan documents within projects. Now, NDW documents can be saved to any path and opened independently of any projects. This becomes particularly beneficial when sending a document to a partner office, or to temporarily open a drawing file from a different project.

As you would expect, import and export has been improved with support for AutoCAD via DWG and DXF from V12 to 2004. Allplan 2005 also supports MicroStation (DGN), Industry Foundation Classes (IFC). There's also been a lot of work done on the links to Cinema4D from Maxon used for professional rendering and animation. You can now transfer complex 3D models from Cinema 4D R9 to Allplan 2005, while retaining co-ordinates. For example, complex structures and freeform surfaces like pavilion roof designs.

Allplan also includes a new comparison tool used to compare different states of a drawing. If a drawing has been amended you can compare the amended drawing with the original drawing and receive a visual result of the changes that have been made. This kind of functionality is typically found in CAD document viewing packages, so it's refreshing to see this inside a CAD package as standard.

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Wizards can be used for guiding users through specific design processes, particularly if there is a variation on a theme. Any drawing can be exported and used as a wizard.



Allplan 2005 has more intelligent sketching, and users can now easily set up numerical offsets and angles on the fly, constrain in X, Y directions, and use enhanced snap points.

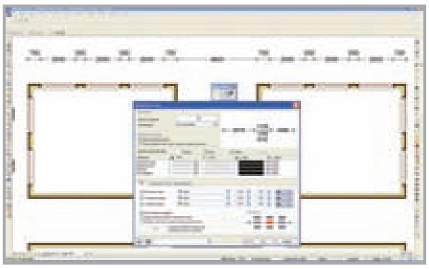
Elsewhere, Allplan's XRefs have been enhanced to include a new Advanced XRef, which enables XRefs to be analysed and evaluated when it comes to creating lists and schedules. For example, when using Advanced XRefs users could carry out a quantity take off to find all the light fittings of a particular type in a building. Using Advanced Xrefs, however, does increase the overall file size.

Allplan Architecture

So far we've looked at the core enhancements to Allplan 2005, which are applicable across the whole software suite. However, Allplan is much more far reaching including specific modules for Architecture, Geo, Structural Engineering and Analysis. The Architecture module, the focus of this month's review, has been updated in a number of key areas, which we'll deal with in turn.

Custom profile walls + beams: One of the most interesting developments, particularly for those working on renovations, is the introduction of profile walls with custom cross sections. Users create or import scale-based 2D drafts of wall profiles and save these drafts as symbols. This will be particularly beneficial to those working on refurb projects, including buildings that feature stepped or non-standard walls. This feature could also be used to create other structural features, such as tunnels – in fact anything that behaves like a wall.

Taking this into the realms of structures, Allplan 2005 also has the ability to create beams with custom cross sections, which will be of particular interest to those working in projects where structural steel is used as a core architectural feature.



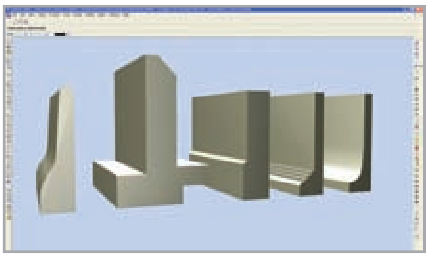
Dimension lines are now always associative, and a new 'direct dimensioning' tool will automatically dimension an entire feature.

Smart Window Sill: Those that have seen AEC Magazine's previous reviews of Allplan will be familiar with the concept of the Smart Window and Door Symbol. Allplan's Smart Symbol designer enables users to define each component of a door or window including the frame, posts, muntins, and sashes. Once defined smart symbols can be saved and recalled for later use. At the same time a representation of the elements for different scale ranges in plan, elevation and 3D is generated. The major advantage of using smart door and window symbols is that if, at any time during the design process, the opening size should change, so will the layout of the design to fit the new space.

New for Allplan 2005 is the ability to create similar Smart Symbols for Window Sills, an architectural feature that Allplan has struggled with historically. With the same flexibility provided by the door and window tool, Smart Window Sill symbols can be created by entering in the dedicated dialogue box standard parameters such as thickness, splay and distance from sill. In addition to using the various options provided in the window opening command, you can now insert window openings and several smart symbols, such as windows, inner and outer window sills, and roller blind housing, in a single step. This is a huge time saver and. Also new for Allplan 2005 is the ability to create Smart Symbols in corner windows.

Architectural attributes: It's essential for the modern CAD system to go beyond core geometry and while Allplan has always had the ability to include key components in material take offs, non-standard components have missed out. Now, new assignment options are available for individual architectural components and 3D models. Although these elements get new object names, Allplan is still able to recognize, evaluate and analyse them as the original elements on which they were based.

You can assign suitable properties to the new architectural components and in subsequent quantity takeoffs, the new object names and the corresponding attributes of the new components can be used in generating common lists of schedules.



Profile walls can now be created with custom cross sections, which will be particularly beneficial for those working on renovation projects.

Quantity Takeoff: Extending the quantity takeoff capabilities of Allplan, version 2005 includes the ability to take off finishing surfaces in rooms. Now users can automatically take off items such as plaster, plasterboard, paint and insulation.

Stair Design: it is now possible to reposition individual stairs and align them with the 2D draft, which has been imported into Allplan. This function is especially useful when working with existing structures, as the treads of the existing stairs may not be constant.

A further improvement enables the thickness of the stair components to be entered as either perpendicular or vertical thickness. If the perpendicular thickness option is used, it is also possible to undercut the treads.

Surface styles: Surface styles allow you to display architectural components with different surface settings depending on the reference scale or drawing type set. You can define hatching styles, patterns, fills or bitmaps for fixed scale ranges or drawing types as surface styles and save these under a name of your choice. This enables you to change the look of your drawings at a mouse click.

Conclusion

Since Allplan was launched into the UK five years ago we've never questioned the depth of the product, and it's still one of the most comprehensive AEC design solutions on the market. From its UNIX roots, improved ease of use was always going to be a natural route for the product to take. And over the past few releases Nemetschek has concentrated on making its tools, both generic and architectural, much more straightforward and flexible, be it with clearer dialogue boxes and icons or improved design processes. In Allplan 2005 a large proportion of the development resources has been channelled into the core draft module for features like more intelligent sketching. While many of these 'AutoCAD-like' actions may seem trivial to some, for others they could make all the difference when getting to grips with Allplan for the first time.

Elsewhere, the addition of window sills, and custom profile walls will provide detail and flexibility for architectural users. And this builds on the extensive work done in the 2004 release with walls, openings, roofs and stairs. Next month we'll be taking a look at the engineering-focussed modules.

www.nemetschek.co.uk

Barts and the London Hospitals

HOK International chose to use Autodesk Architectural Desktop as their primary CAD tool for a project to replace two central London hospitals which placed HOK as architects to Skanska-Innisfree, appointed as preferred bidder by Barts and London NHS Trust.

Barts and The London NHS Trust is one of the largest providers of medical care in the UK including two large hospitals on two sites and literally dozens of buildings within each site. With a proud history going back centuries, these hospitals together now care for over half a million people every year within the City of London, east London and beyond, while also being a major teaching hospital.

In 2002 the trust was given formal approval by the government for a plan to redevelop the hospitals. Formal tenders from potential partners were received later that year and by the end of 2003 Skanska-Innisfree was named as the preferred bidder and HOK was chosen as their project architects.

Such a massive project, which includes what will become the UK's largest hospital, within the very centre of London and with all the concerns over surrounding listed buildings and sight-lines, was certain to raise many concerns. The interests of many parties will have to be satisfied to achieve approval. Amongst these parties are not just the local authorities, the London Borough of Tower Hamlets and the Corporation of London, but also the Commission for Architecture and the Built Environment (CABE), the Greater London Authority, the NHS Trust itself and the PFI organisation as well as the boards, staff and patients of the hospitals and the local people themselves.

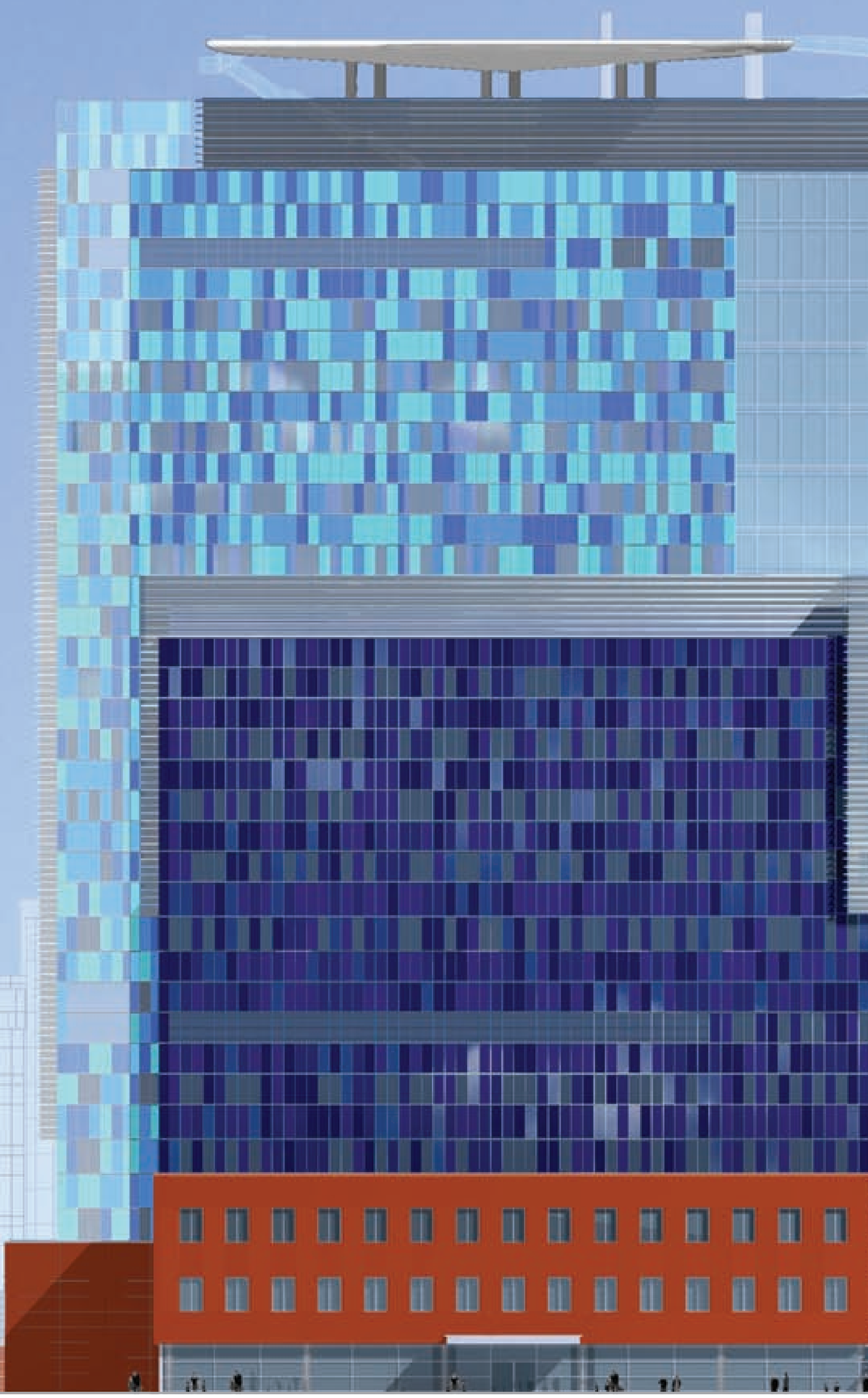
The number of "constituents" is not the only significant part of the project, the sheer scale of the redevelopment is also staggering. Consider just a few of the numbers relating to the two sites; 72 existing buildings, over two million square feet of space and over 10,000 rooms.

It was clear to HOK from the start that managing such a massive project effectively and within the timescales would require the very best design technology tools - hence their decision to go forward with Architectural Desktop which has the "structure" to not just design with objects with all the benefits that provides, but also use of its "Project Navigation" would support the large design team in working on this multi-site and multi-building project.

Design technology goals

HOK Group, which includes some 15 worldwide locations and market groups in over 15 market sectors, has made a major commitment to Building Information Modelling (BIM) in its practice. The firm is a founding member of the International Alliance for Interoperability and sees the intelligent use and exchange of information in the building industry as one of its strategic goals. Patrick MacLeamy, the firm's CEO, has stated that, "Around the world, I want people to think of us as the smartest people out there for managing technology and information".

The firm is especially focused on achieving this in the



healthcare sector. Mario Guttman, Firmwide CAD Director, states that, "We see hospitals as our best initial opportunity to gain added value by maintaining life-cycle information about a facility. Owners are already very savvy about these database issues and they have a lot of high-value assets that lend themselves to management through a BIM approach".

Miles Walker, CAD Manager at HOK London, was key to the choice of Architectural Desktop (ADT) as the design tool. His experience in other projects using ADT had demonstrated that a Building Information Modelling (BIM) approach could ensure coordinated documentation so, to quote him, "BIM became the goal" to successful coordination. In his view the up-front investment in setting up the design systems and processes correctly "would yield fantastic returns early in the design process and with the production of construction drawings and scheduling - and the more iterations in the design process the more BIM would show its value". HOK has had significant experience in using ADT in the past; though not utilised for complete BIM, these experiences have given Miles the confidence that ADT can be applied to major projects.

HOK recognised from the start that the initial stages of introducing ADT into the project, following a BIM process, would be critical and that certain actions would be essential to ensure success. These actions included the following:-

- An assessment of what skills in ADT were already available within HOK, which other HOK staff had the necessary skills to rapidly be trained in ADT and what skills or expertise they might need to bring in from outside; as new HOK staff, as secondments from other HOK projects and countries or as consultants to the project team. In the last category this included Excitech specialists.
- While significant training was carried out at the start it was also recognised and agreed that there would be "incremental" training over time as the project needs developed and new areas of expertise were required.
- Determining the manner in which design data would be exchanged between the different disciplines. For example 3D+ from CSC was to be used for the design of structural elements so special software was developed to both integrate and separate this data from the rest of the buildings' components.
- Standards for many areas of the project were established using features such as ADT's Projector Navigator, databases were developed using Codebook and folders, object and layer standards set.

> "BIM gives us a good reason to review and adapt our current processes to ensure coordinated brief compliant designs are enabled"
>
> *Miles Walker, CAD Manager at HOK*

It has been clear as the project progressed that these actions have saved considerable time by ensuring that the right "rules" were in place to point everyone in the same direction - even if that direction had to be reinforced from time to time subsequently.

Other important goals included the central creation of objects so that the building information model was faithful whether viewed in plan, elevation or section in drawings or viewed from a schedule of components. In this way items

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Here are three examples of the process changes and wins:

- The ability to rapidly change complex Curtain Wall objects throughout 20 floor levels coordinated on plans, sections, elevations and visualisation with individual glazed panels identified, enabled us to schedule 29,000 Curtain Wall Units on the Royal London Hospital with ease sufficient for us to verify Thermal Calculations to comply with Part L2 of the Building Regulations.
- HOK worked with Autodesk, Excitech and Codebook to develop a link from ADT to Codebook utilising the Area Object; previously Codebook only recognised the humble Polyline and we did not want to draw room boundaries twice. So the customisation allowed us to use the Area objects to push the room area to Codebook, meanwhile we are now able to pull data from the Codebook database and attach it as Property Set Data to the area objects. Using this approach we can display brief data in our Multi-View block room tags attached to the Area objects.
- Early last year we looked very closely at the Architectural/Structural integration as we needed to share our architectural model with the Structural Engineers Skanska Technology and Yolles. We also wanted to utilise their concrete and steelwork 3D Object models back in to our drawings. By splitting the structural models we were then able to show structure in our ADT model. Accepting the principle that we, as architect, show our own columns as finishes only (the outer ring) we Xref the structure into our drawings so that the structure (the inner ring) is displayed on our drawings at 1:50 scale.

>> only needed designing once, and if they needed revising, then one revision would update all drawings and reports.

The design would initially be done at 1:200 scale suitable for overall and departmental agreement then from the same data larger scale drawings could be rapidly derived to include all the detail including equipment at 1:50.

ADT in practice

Initial work on the project in 2002 was carried out from HOK's New York office using their team which already had experience with ADT. This provided the time for the UK team to be assembled, trained and brought in to continue once the project was won and the work expanded. Now the project is firmly located in London, though a few of the US team came over initially - and some have stayed with the project.

The design team has been organised into areas of responsibility, with only the core team permitted to actually create object definitions. This ensures not just that they are produced efficiently but also all the right parameters, styles, descriptions etc. are also included as the objects are not just graphical but drive many other document contents.

A general comment from the team is the satisfaction of designing with objects. Once they get into the methodology they find they are able to understand the design much better and identify potential problems earlier. The ability to derive elevations from plans rapidly has further assisted this, and subsequent steps such as producing visualisations has been impressive, particularly when there is a need to explain the design to one of the many interested parties.

The interchange of design data between the structural engineering software and ADT has been improved by two actions. Firstly VBA (Visual Basic for Applications) code has been written to facilitate the easy interchange at high speed to the correct levels and layers: then structural objects have been "surrounded" in ADT with architectural "features" so their locations are always clear. This allows each design discipline to use their design tool of choice while ensuring full coordination.

The commitment and the benefits of designing with objects are clear but they still see the need from time to time to remind people. Otherwise, when a deadline is getting close and a particular drawing has to be produced, there is a temptation to just "draw some lines". Mostly this is a problem with a few project members who stray back to their traditional ways of working. However, this is increasingly recognised as producing a short-term gain but a longer term loss which if left in place will cause problems later.

The export of object information for quantity surveying has been aided by the use of a third-party application called Estimating Desktop, which also aids, to a certain extent, some initial costing.

With such a large project and with the use of new technologies and methodologies, HOK have increasingly recognised the importance of those early set-up decisions. According to Miles, both Autodesk and Excitech provided invaluable support at both strategic and tactical levels right from the start and Excitech's Tim Bates has continued to "provide an invaluable second opinion and guidance based on his expertise in the use of BIM and ADT".

BIM and interoperability wins

HOK have found their approach to Building Information Modelling has provided key benefits compared to a more traditional CAD approach often used by architects. Miles was keen to point out that "BIM is a holistic methodology that is more than just a single software solution. It gives us a good reason to review and adapt our current processes to ensure coordinated brief-compliant designs are enabled".

What the team thinks

In describing how the project has progressed Miles is keen to share the credit for what has been achieved by the whole HOK team of 50 people but a few individuals can highlight interesting aspects.

Graham Davies is one HOK's senior medical planners who initially worked on the project in their New York office even before ADT was adopted as the design tool. He is now working in the UK having been here since the beginning of 2004 and has found the health requirements standards are more rigorous here than in the US. He agrees with Miles that planning and process for implementing BIM are critical for success. Indeed "any firms doing it half-arsed can fall flat on their faces" he says, "and time invested early can reap great rewards".

ADT has allowed faster and much more accurate scheduling of spaces to the client's needs, and the requirement from the 160 departments for process flow information could be produced efficiently. He is convinced that using ADT gave HOK a competitive edge as they need "spend less time on mindless tasks and can extract data to Excel and produce reports in just a few minutes for comparison against the client's requirements".

George Dimitrov is another member of the team who has had previous experience of BIM - though while working for an Autodesk competitor. Amongst other tasks he has been responsible for the integration of the structural data. Normally, each iteration might have taken a week to do, but now the code they developed will process this in just a few hours. In his view ADT has been a



tremendous tool for the project and, he says "features like curtain walling are incomparable with anything else on the market". He'd also advocate ADT because "it can hold the entire building model and has numerous powerful and productive features". In his view the major challenge on this project has been the large number of people involved. This could have posed a serious coordination problem, but ADT and BIM have helped manage this.

Steve Hartwanger is another senior member of the design team who has used ADT previously in South Africa, though only for a short period. His particular responsibilities include coordination of the CAD model and the definition of objects. Having been "trained up" from AutoCAD he is aware that some AutoCAD users are reluctant to try to use something new, and he highlights the difficulty in convincing them of the potential time savings. However, from his position he says "people must stand back and view the whole lifecycle of a project; the initial management and set-up overhead of ADT is tiny for the gains you get later".

Results and conclusion

At the time this article was written, final planning approval of the design was achieved. During the design approval process, the number of revisions made - and indeed the iterations throughout the design process - have been made easier through the use of object-based design. Whether it was confirming the detail for particular internal wall types or changing exterior panels, ADT has proved its value not just in updating drawings but also all the other documents and reports.

The determination to assemble the right team, to set and maintain standards and to use the techniques employed have proved to be correct. Furthermore, as the project progresses towards detailing and construction drawings as well as schedules and reports, the productivity benefits of ADT are becoming more and more valuable.

HOK is also developing a better understanding of the requirements and benefits of using BIM. The large volume of information has necessitated the development of new standards and methodologies internally at HOK, as well as amplified the need for better industry-wide standards. This project has become a model for how the firm can use its advanced BIM capability to offer value to its clients, as well as a demonstration of the capabilities of ADT.

www.excitech.co.uk

COFES 2005

Each year in the desert of Arizona, the Computer Aided Design community gathers to talk about the future of engineering software at Cyon Research's unique event. Martyn Day was in attendance.

Martyn Day

The CAD industry has many annual conferences and events; from specific vendor's shindigs like Autodesk University to those with vertical market focus, e.g. Daratech Plant. Cyon Research's The Congresss on the Future of Engineering Software, or COFES is something quite different and has been created by the industry research firm, Cyon Research. Held in Scottsdale Arizona, the event attracts representatives from the majority of Engineering software vendors, together with industry notables, customers, analysts, start-ups and business angels. While the agenda is fairly mixed and split between Mechanical CAD and Architectural CAD, there is plenty of time left over for networking and ad hoc technology demonstrations.

This years event was entitled, "Innovation in an Idea Economy: Putting Your Money Where Your Mind Is". Recognising that new products are usually applications of existing inventions, brand new ideas and concepts come along less frequently but these spawn new industries and technologies. Cyon explains that 100 years ago it was the car; 50 years ago, the transistor; ten years ago it was the Internet, so what's in the pipeline? With so many manufacturing jobs leaving the Western economies, Cyon wanted to push the concept that wealth will shift to those industries and those economies that foster inventiveness and innovation, meaning the high-paying jobs will exist in those economies that recognise the value of knowledge creation and capture, the fundamental building blocks in a knowledge-based economy. According to Cyon, it's no longer enough to build products better, cheaper or faster. The winning hand goes to the player that is able to innovate and capitalise on its intellectual property. It's not just about what tools you use to design, it's about how you use, analyse and reuse that data.

While other such forums have all been sucked into the bottomless pit of PLM verbiage and marketing, Cyon has managed to keep COFES remarkably free from the warping powers of the really large vendors, yet they still send representatives to listen and join in the mix. That's not to say PLM isn't a topic for debate but it's just not 'all dominating'.

Keynotes

The arrival day started off easy with a late afternoon talk given by Peter Thorne, of UK analyst, Cambashi. Peter gave a great presentation explaining to the many Americans at the event, what was happening in Europe, compared to the US. Being based in the UK, it is quite amazing what many US-based companies think is going on in Europe. There still seems to be a 'one size fits all' attitude to Europe – that and thinking what happens in the US happens in Europe, eventually. The key take-away point was that all the new EEC countries are seeing most of the growth as investment flows into these low-cost manufacturing economies.

Day Two started with Dr David Weinberger's analysis of the web and how information is structured. David sees the web as a key instigator in freeing information from previous classification and storage methodologies, where data is grouped and stored hierarchically in categories. Web search tools and the nature of the web's intrinsic messiness, means unstructured data is good and free from limitations. Many examples were given, especially with RSS feeds and readers but the underlying message was that knowledge and authority over knowledge will change.

Day Three introduced Peter Marks, of Design Insight, asked what the future of engineering software was in an economy where manufacturing is in decline and services are on the rise? One of his conclusions was that the services vs. manufacturing debate is largely irrelevant. Services merely shift the focus and intensity of new product development and manufacturing from end users to service providers. Another conclusion is that a new breed of engineering software will emerge – one that better supports services. For software and hardware vendors this means a shift in both target customers and software offerings. For users, it means reevaluating what it means to innovate. In previous talks Peter predicted the non-event of the Y2K issue and also predicted the bubble in the dotcom growth

The main homage to PLM took the shape of a panel, chaired by Dave Burdick of Collaborative Visions. Entitled, 'Fuelling the next engineering market growth cycle', the panel included: Buzz Kross (Autodesk), Brian Shepherd (PTC), Raj Khoshoo (UGS) and Dominique Florack (Dassault Systemes). PLM has been relatively stagnant, growing at 5% or less per year and still being 1/3 less in revenue size than ERP. It has under-performed its market predictions, so how can growth be generated? This promised to be quite interesting but ended up with each vendor just trying to justify why each of their respected visions of PLM was more meaningful. PTC appears to have



lowered its sights from the very high-end to the mainstream and small business workgroups. Autodesk is just about delivering a very basic EDM system, with pretensions to get a PDM product in place over the next three years – however they have huge numbers of users and a low cost of entry. Raj from UGS was probably the most comfortable talking about the high-end as TeamCenter has undoubtedly been the biggest success from UGS's merger with SDRC. Dominique from Dassault talked with great passion about Dassault's vision and probably was the most compelling, as the Catia/ morphing vision being deployed by Toyota sounds so space age, however Enovia and Delmia sales have yet to come to the fore at the company, with SmarTeam getting more success at the PDM level. The fundamental fact is that PLM has yet to gain any traction with users outside of Aerospace and Automotive – after millions of dollars spent on marketing and talking about PLM, the majority of customers I talk to still don't know what PLM does, unless they think it's PDM. The industry analysts are responsible for over-hyping PLM for their masters that it may never live up to the expectations that were originally associated to it.

> 'Technologists' are insatiable technology addicts and appear to have severe problems coming to terms with why other people 'don't get it'

Publishing Formats

I've written about the engineering 'Publishing format' war that's currently going on many times and it just so happened that the first ad hoc meeting was with one of the independent players, Lattice 3D. The publishing format issue provided me with a running thread of demos, conversations and bemusement throughout the three days of COFES. Off the top of my head, the congress attracted: Adobe (PDF), Dassault (3DXML), Autodesk (DWF), UGS (JT), SolidWorks (e-drawings), Lattice 3D (XVL), Actify (.3d), Intel (U3D), N-Grain (voxel-grid based) and Right

Hemisphere. I would hazard a guess that we have more proprietary 3D publishing standards than we have actual proprietary CAD formats. Our industry strikes again – we all agree that standards are a good thing, indeed like tooth brushes, but nobody wants to use anyone else's. One could argue that this somehow provides choice for the industry; it unfortunately just means possessing many free viewers on your PC.

My main exposure to the publishing formats on this trip were with Adobe, Lattice 3D (***www.lattice3d.com/***) and N-Grain (***www.ngrain.com/home.html***). My first meeting was an impromptu demonstration of Lattice 3D. Lattice is originally a Japanese company that 's partly owned by Toyota and in fact Toyota uses it internally. Lattice 3D is a reseller and developer of the product – this caused some confusion and I will come to that later. The system is without question the best format for storing 3D data that I have seen to date. Based on the XVL format, Lattice has worked out a way to describe solids as a series of NURBS surfaces, this allows incredible control of the size of the XVL file but also allows scaling and some degree of control as to how accurate the portable file can be viewed or printed. The competition tends to break down models into just tessellated surfaces, which can be a bad approximation. UGS's JT format sores a number of different representations at varying resolutions of tessellation. As Lattice went for NURBS, it's very much like Postscript – highly scalable from just the one source file. It can be incorporated into Office documents, marked-up or displayed streamed over the web.

It's not just popular with customers, Dassault system uses the technology as a key component of its 3DXML publishing format and there are rumours of other vendors licensing the products capabilities. As the event had both Dassault and Lattice 3D present, at times I felt like I was the ping in the pong between the two companies, while trying to get to the bottom of who did what and how Dassault works with lattice, not Lattice 3D. Still, when you see the technology it's just obvious why it has advantages over most of the other 3D formats out there today.

N-Grain is a company that's new to me but it's also a different take on the old publishing format. The company uses a Voxel-grid engine to represent the geometry. A Voxel grid is a 'gappy' representation of cubed shaped grids, almost like a 3D raster model. Depending on the resolution as you zoom into the model you will see some rasterisation and 'zaggies'. Still the models are pretty small and easy to manipulate.

N-Grain doesn't have any large partners like Dassault to help push the technology and so has been left to forge ahead on its own. To date the company has focussed on the military market and specialised in the creation of manuals and websites with 3D interactive graphics. I'll be looking at the N-Grain technology in more depth next month.

Adobe (***www.adobe.com***) was at the show in great numbers, emphasising the sheer size of PDF in the Engineering market. While I think Adobe made an error selecting Intel's U3D format, as nobody else supported it, it seems that Adobe is mustering many more vendors to start supporting U3D output and has made some strategic technology purchases to enable the capture of OpenGL 3D data to create U3D models – this bypasses the need to get at the data through all the different CAD systems' APIs. Autodesk is also developing similar technology for its DWF format.

The one technology from Adobe that is attracting my attention is the Policy Server technology that an organisation can purchase to control documents in circulation without a typical document management system. At the moment it's not cheap (about $40K) but it appears to offer unprecedented control over important documents. PDFs that are emailed out can check back when used on a system that's on-line (you can chose for the PDF to be only viewable or not when there is no Internet access). Using the policy Server you can control the level of printing (high, low or no printing), immediately stop access, set a cut-off access time, count the number of times it has been opened, see if anything has been cut and paste out of it or inform the user that a more up to date version of the document is available and point out where it can be downloaded from. Turn to page 22 for more on this technology.

Mixing

So many people, so little time! While the morning sessions are usually kicked off with a presentation, the afternoons are reserved for private meetings and visits to the various companies' technology suites. On the first day the industry analysts are on-hand to give their interpretations of what's happening, while the second is more technology and development focussed.

Here's a brief run down of some of the people I met, what we discussed and some cool technology that's coming our way in the next year.

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Jon (Hirschtick) is an industry giant, and I'm not just referring to his height; then again everyone is taller than me anyway

Bob McNeel, CEO, McNeel Associates

www.mcneel.com

Bob McNeel is one of the most pleasant people in the industry and COFES gave me an opportunity to catch up with what's been going on at McNeel Associates. McNeel develops and sells Rhino, the low-cost surface modelling tool which has over 150,000 customers worldwide. The software is used in all sorts of industries, from footwear to architecture and is certainly excellent value for money. Bob won a lifetime achievement award at this years' COFES and it was well deserved, as Bob has provided great leadership in providing value with his CAD dealership and innovative software development (with products like AccuRender). I asked Bob if he would ever contemplate selling out to a big player, to which he replied after some contemplation, "is there enough money out there for someone to give me to stop doing what I love doing? Probably not."

Our conversation then went on to today's innovative products, Bob having just come from an optics conference. There he had seen a laser device that could work out diabetic's glucose levels without the need for needles, a scanning electron microsope that fits in your hand and the military showed a laser that could cause burning sensation in skin, without causing any damage (one wonders what the last device would be used for?).

Jon Hirschtick

www.solidworks.com

Jon is an industry giant, and I'm not just referring to his height, then again everyone is taller than me anyway. John was one of the founders of SolidWorks and is a regular COFES attendee and while he's there to represent SolidWorks he is also known as a business angel and investor. Throughout the event many of the new start-up firms would seek out Jon's opinion on their product and look for advice.

We talked about a number of issues in the industry and talked beyond CAD into the realms of open software, an area which John is particularly excited by. The quality of free software that's available for Linux has amazed him. On the CAD side we talked about the complexity of SolidWorks (the product) and the increasing difficulties of improving software quality as these CAD products increase in size, complexity and functionality. Jon acknowledged that SolidWorks had issues in the past with bugs and stated that quality was now a key focus within development, starting with the forthcoming release of SoldiWorks 2006. We talked a little about 'Cosmic Blobs' and how the company was looking to innovate to make modelling easier, yet more powerful. While Cosmic Blobs is essentially a kids toy, if follows the Xerox Parc methodology that if a kid can use something, then an adult can – development that ultimately led to the Windows interface.

SolidWorks and Autodesk are still locked in combat for the mid-range CAD market. SolidWorks has developed eDrawings for Inventor, provided a DWG compatible 2D editing tool and recently added DWG gateway – a potentially powerful tool to save AutoCAD DWG files in current or past DWG formats. It's pretty clear that SolidWorks is trying everything it can to get into those 2D AutoCAD accounts. Jon and I talked about the strong bond that SolidWorks maintains with its customer-base, which is unique in the industry, despite hundreds of thousands of users. While SolidWorks is keen to grow towards its target of a million customers, at the same time it's looking at ways to keep its relationship with those users. It's a tough task. The market also seems to have stronger competition these days, with PTC on the rebound and Autodesk improving its products and channel.

Brad Schell, CEO, @last Software (SketchUp)

www.sketchup.com

We are big fans of SketchUp here in the office. It's a low-cost 3D conceptual modelling tool that comes from a small operation running out of Boulder Colorado. In fact the company's HQ is a shop on the main street of Boulder, complete with large glass front window. I'd never met Brad before but he really impressed me and made me laugh. The product is growing world-wide and even competitors like Autodesk have nice things to say about the product and the development team. The conceptual market has really been a tough nut to crack and SketchUp has been the most successful application in that space. Brad and I talked about how tough it is to make a new market for yourself where all others had failed. The worry being that by showing the way forward, it's possible for the big vendors with deep pockets to come in later, after the hard work has been done and copy the formula. As things stand, the company is still adding considerable new functionality to each release and shows little sign of slowing down. Hopefully with a growing base, an innovative edge and a good view of customer relations, @Last will either carry on making its niche, or be made an offer they can't refuse from one of the industry giants.

If you haven't seen Sketch-Up yet, go to the website and download a free trial.

Arnold Van der Weide President IntelliCAD Technology Consortium

www.intellicad.org

The IntelliCAD consortium started out as Visio IntelliCAD – the first AutoCAD clone which tried to take on the power of Autodesk and provide AutoCAD feature by feature compatibility at a vastly reduced price. However, the product was released too early and Autodesk fended it off successfully with LT and a negative advertising campaign informing users that its products were 100% DWG compatible, not like this AutoCAD emulator.

After Microsoft bought Visio, IntelliCAD found a new lease of life as a product developed by a consortium of Autodesk competitors, acting as a repository for DWG knowledge, providing libraries to develop products like SolidWorks' DWG editor and DWG gateway. IntelliCAD is also a stand alone CAD platform. Arnold is an industry veteran having worked for many of the major CAD vendors. Arnold explained that he sees IntelliCAD now as being a serious development platform for application specific developers who need a CAD tool, with AutoCAD compatibility, to produce dedicated solutions. Apparently in Holland IntelliCAD forms the basis of the industry-leading tool which is used in dredging the country's many waterways.

Arnold's future vision for IntelliCAD seems to divert from the AutoCAD emulator that it was originally created for – adding new features that aren't necessarily in AutoCAD and not necessarily copying features that are added to AutoCAD, while maintaining a strong support for DWG. This is an interesting departure, although I do wonder what other members of the consortium think of this concept. Talking with Arnold it's also interesting to hear that the development work is carried out all over the world, in a true 'virtual' way.

One has to wonder if anyone will seriously challenge Autodesk's dominance of the 2D CAD market, especially as the price of LT is heading for the £1,000 a seat mark? Most of the other vendors are off developing 3D solutions, forgetting that the majority of work is still done in AutoCAD and LT. There has to be space for a decent 2D tool with a brand-name people can trust.

Hewlett Packard

www.hp.com

There were a number of folks from HP at the event showing the lastest in AMD Opteron workstations (see www.mcadonline.com). The one interesting snippet that I picked up was that Microsoft was paying HP to go around the world and buy-back all the Itanium-based workstations that it had sold. In the US this only numbered 150 or so. These workstations were Intel's first attempt at a 64-bit processor. Unfortunately it didn't run existing 32-bit applications very well/ fast and was blasted away by AMD's latest generation of 64-bit processors. It seems Microsoft didn't want to continue developing the Itanium version of Windows and so was helping take them off the market, and HP were replacing them with AMD-based workstations. HP played a major part in the development of the Itranium, providing a lot of RISC know-how to the Intel development team. Unfortunately Itanium chips were also very expensive.

Rick Stavanja

www.cadwire.net

Rick is the technical guru and editor in chief of CADwire, a popular link for CAD news, commentary, reviews, events and articles. Rick was demonstrating a new CAD-related search engine that he was developing. It will be the CAD equivalent for Google, providing a dedicated search tool that specifically scans known CAD resources for more accu-

rate results. The search tool can also be embedded in other sites, as you can with Google.

Ping Fu, President and CEO, Raindrop Geomagic

www.geomagic.com

COFES was attended by many of the industry's leading lights and while winding down over a few beers I met Ping Fu, who, from everything I've read about her since, is well deserving of that title. What's even more amazing is Ping's life story, from 'leaving' China for offending the authorities for writing about human rights issues, to starting from scratch in the USA, going through college, finding work, achieving success and then taking huge risk in turning around he point-cloud firm which she now runs. Hearing this story is a very humbling experience, to a 'lardy' westerner that's never really had to work hard for much.

Wilfred Grabert, GiveMePower

www.givemepower.de

On the final day, over breakfast, I talked with Wilfred Grabert, CEO of 'GivemePower'. Wilfred used to own some AutoCAD dealerships in Germany and the UK but now he has started a company with his son and developed some innovative AEC software. The concept behind the solution is that it's difficult to capture and digitise the internals of already built structures. To solve this, Wilfred's software is a new CAD system which is happy to run on portables as small as PDAs or on normal workstations that work in conjunction with the current generation of GPS and laser scanning measuring tools. By walking around the building and taking measurements, the system automatically builds up a highly accurate 3D model of the spaces. This could revolutionise refurbishment work and could be used to check as-built against architects plans.

Conclusion

On reflection, while I write about technology and still run the applications, COFES is both a heaven and a hell in the same place, at the same time. The event attracts some incredibly smart people, individuals who have actually made this industry possible. But there is also a negative of getting so many technologists and futurists in one place. By the end of the event I was convinced that everyone was on some kind of 'Technology Prozac'. There is a reality to technology adoption and it's a fact that we can innovate and regenerate products and ideas much quicker than we can understand them and deploy them. There is a limit to how much change you can inflict on an installed base and while many innovations are welcome, there are many, many more that are not adopted. Selling CAD tools on their productivity benefits may no longer be a valid reason, as we have over capacity to produce in so many industries. In some ways this is probably why PLM has been the mantra for so many developers as it expands their influence and revenue possibilities outside of the engineering department.

Jumping to the summing up sessions of both AEC and MCAD, they went along the lines of 'We have this great technology, so what's stopping wide-spread adoption?'. While many reasons were given, there is little understanding of the psychological impact of constant change and how customers adopt technology. While we have perfected the art of development and incremental updates in Engineering, we are but flesh and bone and have internal capacity limits. 'Technologists' are insatiable technology addicts and appear to have severe problems coming to terms with why other people 'don't get it'. Don't get me wrong, I'm really glad these people are here, always looking forward, identifying trends and looking to solve both current and future problems but reality should dawn once in a while. Maybe my net contribution to the planet will be discovering a pessimism pill? (obviously to be taken with a glass of water, half empty).

www.cofes.com

> There is a limit to how much change you can inflict on an installed base and while many innovations are welcome, there are many, many more that are not adopted



Adobe LiveCycle Policy Server

Document control is a major issue for engineering and building firms. Adobe has come up with a system that uses the Internet to allow the authors to retain complete control over documents sent outside of their companies.

Martyn Day

Product: LiveCycle Policy Server **Supplier:** Adobe **Price:** See text

Imagine, if you will, a technology that enables you to send secure documents to project members, outside of a traditional document management system, that allows you to retain control and provide feedback on nearly all aspects of that documents usage. A system which provides a mechanism to pre-determine a 'time-out' date, after which it cannot be used, or a real-time ability to render documents unreadable by specific team members, contractors or companies bidding for work. Imagine being able to universally remove access to an old drawing that has been updated, on any user's machine, wherever in the world, while pointing them where to download the current version. Consider the benefits of a tool which provides an audit capability on the usage of one of your documents at another site or firm, such as how many times it has been opened, copied, forwarded or printed. Adobe calls this persistent control. After running the system at the office on a server, I call it bloody amazing!

Adobe PDF is pretty much an industry standard in both the MCAD and the AEC markets. The benefits of PDF are obvious; a common format that everyone can read (Acrobat reader is omnipresent on most PCs), a format that acts as a wrapper to encapsulate nearly every other digital document (Office, CAD etc), document review/mark-up, powerful digital forms capability, add digital signatures and add levels of security, like encryption that can protect the contents from those that don't have the password. However, after a PDF has left the building, with whatever security settings you have assigned, it pretty much has a life out of your control. This is where, to give it its full name, Adobe LiveCycle Policy Server (ALPS) comes into the picture, extending control of that document outside of your Firewall, online and offline.

With Adobe Acrobat PDFs you can have three levels of security: Password, Public Key Encryption and Adobe LiveCycle Policy Server. For Password and Public key protection, it's possible to create and reuse the same security settings that are stored on the local computer. With Adobe LiveCycle Policy Server, the security settings are stored on a server and managed by an administrator.

So, as the name would suggest, Adobe LiveCycle Policy Server is a server-level product which is targeted toward medium to large enterprises. While it could be deployed within just the engineering department, the kind of capabilities on offer could be used by any part of a company that distributes sensitive information, or simply wants to retain control of its Intellectual Property (IP) wherever it may end up, even behind other firm's Firewalls.

The key to this technology are the security components delivered within PDF and Adobe Acrobat, as only Acrobat PDF files can be controlled and maintained in this way by the Policy Server. The essential components to this product, are the freely available Acrobat Reader clients, the Acrobat (and/or Professional) PDF authoring tool and the LiveCycle Policy Server. PDFs are secured using 'security policies' set in the PDF Authoring tool, while linked to the Policy Server. Security settings can also be done via a batch file or within products such as Microsoft Outlook. All security settings are stored on the LiveCycle Policy Server. These secured PDFs are then distributed by normal email methods (Microsoft Exchange Server etc.) to individuals or organisations and they are opened in the free Acrobat Reader clients, which link back, over the web, to the Policy Server when they encounter PDFs that have security policies limiting access or usage. However the web is not essential to control access as the PDFs can have default settings should a PDF and Reader not be online (perhaps on a laptop during a plane journey). Here secured PDFs can be configured to not open at all, or open with many Acrobat capabilities restricted, such as the ability to print.

In use

The application resides on a server behind your firewall and serves up an HTML administration console to allow its configuration - that's to say, set up distribution lists, audit features the security policies. Once people have been added they are notified that they have been granted rights to receive secure documents and they register with the server. Each time they get a document and launch Acrobat Reader to view a secure document, they must log in.

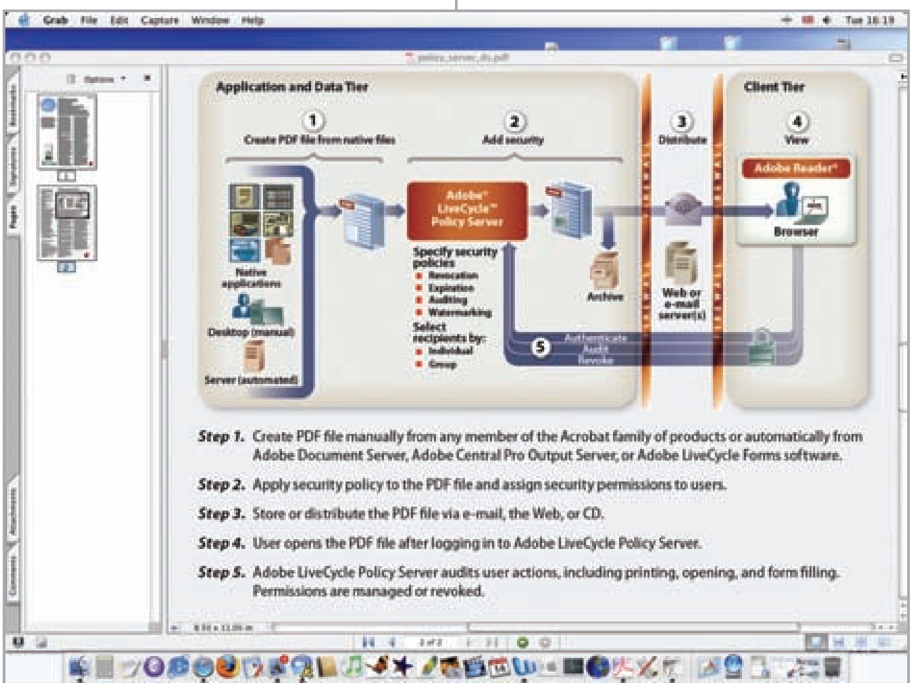
Security policies are similar to a template or preset, and they capture your security settings for reuse. There are two kinds of security policies that you can apply to PDF documents. A user policy is developed and applied by an individual user, and is stored on a local computer. An organisation policy is developed for an organisation and is stored on a policy server to be shared by a group. These security policies can be stored as favourites and appear in Adobe Acrobat authoring when looking at the security menu. It's simply a case of applying a preset security setting to the current document e.g. the document may only remain accessible for two weeks and then all viewing rights will be revoked.

It's possible to set many criteria in a security policy, like: 'no printing', 'reduced resolution printing only' and 'no editing'. For each security policy it's also possible to configure the audit capability, logging such events as how often a document has been printed, modified, open/closed, form filled or signed. Using the Admin tool, it's possible to call up the audits for each of the documents and see exactly how people inside or outside of your company have used it.

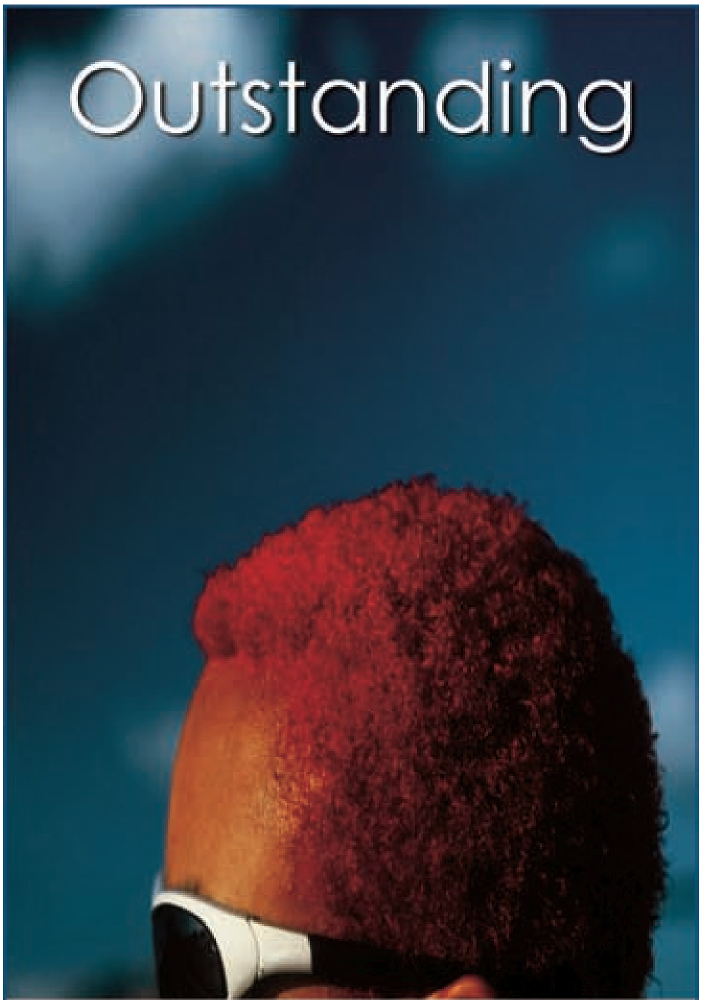
Unlike most of the software that we review in this magazine, Policy server is a true enterprise application and needs to be set-up within the framework of your existing network. In our instance, the server took the engineer a day to install and set-up but was quickly in use after a short demonstration of the features now available both within Acrobat and from the Admin console.

Pricing

To buy the server outright, the product is not cheap, weighing in at $50,000. However, Adobe offers other flex- »



« PDF document flow using Adobe's new LiveCycle Policy Server.



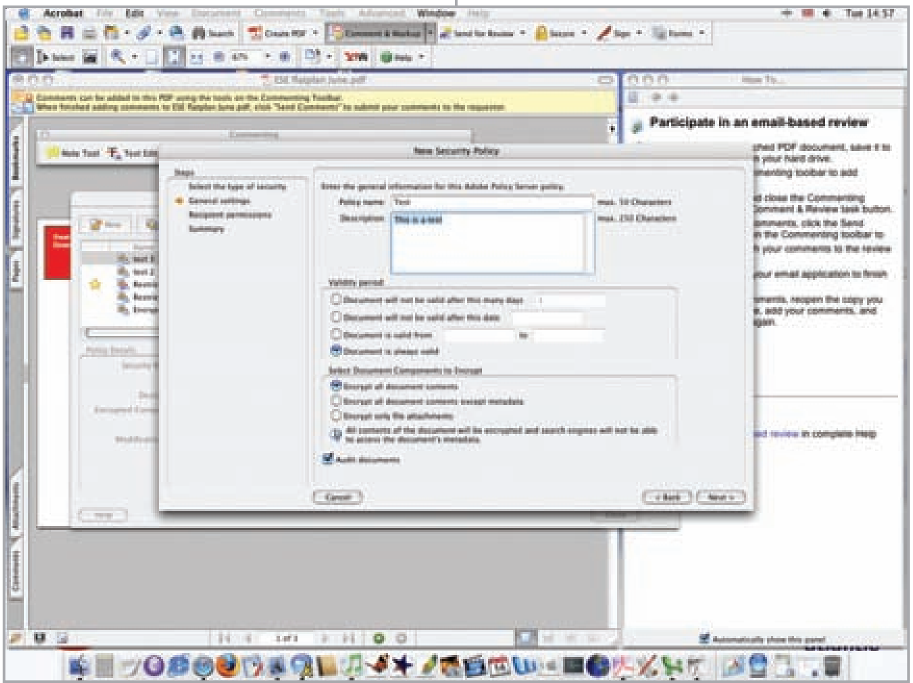




ible models; The pricing for Adobe LiveCycle Policy Server has two other options: Per User or Per Document - the later is suited for standard volume documents; i.e. electronic statements, forms or e-invoices and is priced from £7,000 per document type (i.e. a document type would be; standard high volume invoice generated as a PDF from an SAP system with the underlying XML to provide system-to-system integration.) This comes down to £3,500 per document type if you pay to add up to 50 document 'types'.

Then there is User based pricing which starts from 500 users at £44 per user, but as soon as you get to 1,000 users, this dips beneath £36 per user...and at 5,000 users it gets to £30 per user.

There are also some integrated suites, where Policy server comes bundled with our LiveCycle Enterprise Solutions for Manufacturing; like Adobe's process management suite and document generation suite - both of which integrate with ERP, Supply Chain and PLM systems where Adobe LiveCycle Policy Server becomes more attractively priced in as part of a total package.



Conclusion

I have to admit that the powerful capabilities that Adobe LiveCycle Policy Server offers, do come at a considerable cost. However, it is a unique way to maintain control of data outside of a traditional managed environment. On important projects, where security, or something as simple as ensuring everyone has access to the most up to date drawing is important, the policy server addition to PDF, could lead to less errors on site, better traceability, accountability and more control.

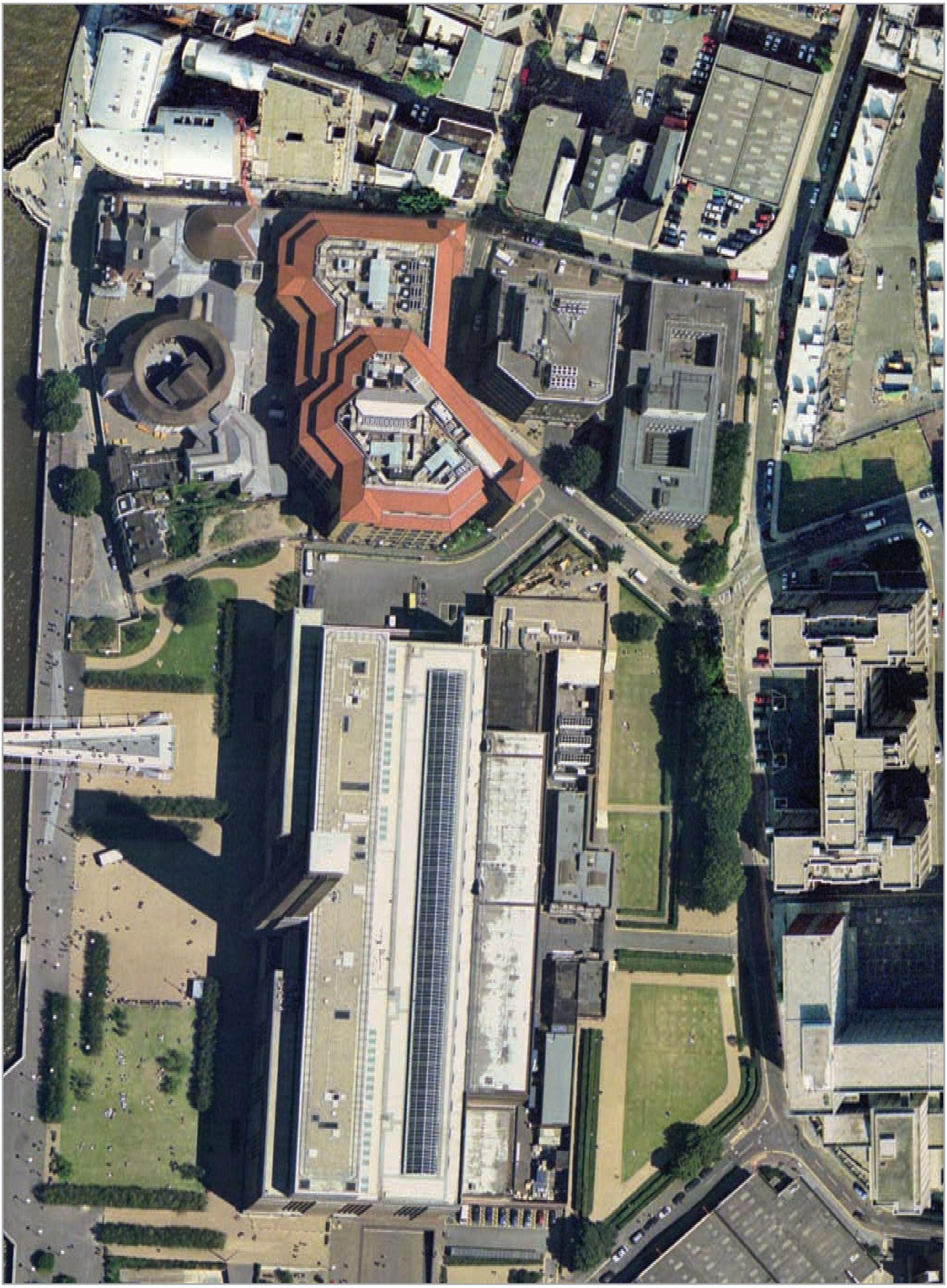
One obvious advantage would be the control of documents at remote locations, such as on-site at a construction, or at a remote/offshore manufacturing plant. Instead of using a web hosting service, Adobe LiveCycle Policy Server would allow the architect or design company to issue new drawings, while withdrawing the others. The web hosting option would allow the contractor or production manager to continue using the old version, should they not be informed of an important design change, which produces a revision.



Adobe is working with a number of other developers to refine Policy Server's capabilities within the CAD market, extending the control and reporting function to include more engineering functionality. It would be interesting, after all, to know if any geometry was copied and pasted out of your drawings, or maybe selectively chose which parts of an assembly can be seen by different suppliers. It will be fascinating to see how Adobe will progress this technology in our market. The document industry hasn't yet done a good job of making encryption and digital signatures particularly user friendly. This solution takes all the pain and hassle of using public key encryption, as well as digital signatures, you simply apply a security policy and the document obeys.

If your company uses PDFs as a standard format for document distribution and the volume and value of the content is worth protecting, I highly recommend trialing an Adobe LiveCycle policy Server, it sort of works like magic.

www.adobe.co.uk



Beyond, behind & above MasterMap

Continuing his series of articles on digital mapping, James Cutler, emapSite takes a closer look at the use of imagery and aerial photography and their value to disciplines across the Architecture, Engineering, Construction sector.

James Cutler

Previous articles have focused on (re)introducing OS MasterMap to an AEC audience under pressure to achieve more with less more quickly and encumbered by the prospect of the demise of familiar large scale mapping and the need to adopt OS MasterMap. The number of organisations now using OS MasterMap (over 10,000) along with the productivity gains, performance benefits and ease-of-use now evident serve to illustrate that technicians and project managers alike will be able to realise these goals.

Beyond

Not only is OS MasterMap Topography Layer (to give the core product its full title) much more than a replacement for Land-Line/SuperPlan, but it is the first in a whole series of digital mapping and related products. This article serves to raise the profile of imagery and aerial photography in particular and its value to disciplines across the AEC sector.

The term imagery has historically been associated by many with satellites and relatively wide area coverage not particularly relevant to UK based CAD and GIS users. Aerial photography on the other hand has long been recognised as a valuable if sometimes costly tool in site reconnaissance and contextual analysis containing as it does a more accessible (in the widest sense) view of the area concerned and providing, either on its own or in combination with other mapping, the facility to highlight sub-surface features, generate 3D urban landscapes, identify land use and much more. Photogrammetry is the (series of) technique(s) used to extract both 2D and 3D geographic information from aerial photographs and associated capture parameters. The resulting 3D models are relevant to any number of applications including noise and pollution modeling, pipeline routing, telecommunications installation planning and earthworks measurement.

The evolution of technology in the imagery/remote sensing sphere and the emergence of a consistent national database of aerial photography means that CAD and GIS users now have a plethora of choices when it comes to augmenting their applications and communicating with project managers and other stakeholders.

Many consulting engineers and environmental consultants have over the last five years come to see aerial photography as a vital and cost-effective adjunct to their day-to-day activities. For example, photography played a role in planning site sampling surveys on the Isle of Sheppey while it was also used to provide a real-world context during public consultation on the Biggleswade bypass.

Tate Modern image aerial photograph – Copyright Getmapping.

Behind

It is perhaps not commonly known that while OS MasterMap Imagery layer represents but one source for consistent aerial photography (others include getmapping, UK Perspectives, Cities Revealed and their resellers), Ordnance Survey has long operated its own air survey squadron. OS has used this resource on an ad hoc basis to capture traditional aerial photography to aid in the process of updating the large scale map database of which OS MasterMap Topography is the most visible outcome.

It is possible to acquire some of this data through the OS Options network in hardcopy non-ortho-corrected form (i.e. with all the errors caused by terrain, aircraft attitude, camera and atmosphere, collectively most noticeable in the form of distortion away from the centre of the photo). And herein lies both the challenge facing the suppliers and the understanding required by the user – not only are there diverse sources but imagery itself can take many forms.

Traditional pairs of hardcopy airphotos are still used (with a stereoscope) for land cover mapping and other (normally resource planning) applications. Photogrammetry has evolved into a "softcopy" discipline in which digital stereo-pairs are processed using a variety of semi-automated workflows to derive planimetrically accurate 2D and 3D airphoto mosaics, terrain products, contour maps and much more. The initial data capture solution (film camera, digital sensor, small format camera), processing approach and type of product required determine the degree of precision used in the photogrammetric process, the tolerances accepted, the accuracies resulting and to some extent the fitness for purpose of the final products. They also contribute significantly to the price of the product in the market place! These are all factors that the user needs to consider and in which technically proficient resellers provide a balanced assessment and choice.

Above

Commercial aerial photography with a spatial resolution (or detail level) that enables individual trees, outhouses and even livestock to be discriminated from their surroundings is now



Millennium Dome satellite borne image – Copyright Space Imaging.

common-place and costs have been decreasing owing to competition both within this market and from the new generation of satellite borne imagery and other airborne tools.

Chief amongst these has been the new generation of very high resolution satellite borne sensors (often referred to collectively as VHR). VHR sensors have a detail level close to aerial photography, a much greater simultaneous capture area and a higher frequency of site overpass than aerial photography. In addition the resulting images are easier to understand and more analogous to aerial photographs than previous generations of satellite image. Hence, it is easy to understand how Quickbird, IKONOS, IRS and SPOT have become serious options for project management, emergency services , urban planning and other disciplines when seeking up to the minute visually valuable information on which to overlay and contextualise other detailed information, be it address, route or district specific. As the VHR suppliers struggle with business models that make such information accessible on a near-real-time basis for small sites (i.e. without punitive satellite commissioning charges and minimum orders) there is no question that the huge volumes of archive data being stored represents a true challenge to aerial photography.

Aerial photography providers have responded with the take up of a new generation of capture technologies and the ability to promise of far greater detail (5-6.25cm) for urban areas, more frequent coverage and faster delivery. In addition there has been an increase in the use of online channels (for example, ***www.google.com***) and the emergence of new tools for visualisation (for example, ***www.pictometry.com***).

In the UK weather conditions have been the long-time enemy of all image capture ventures and this is not likely to change any time soon. However, the GIS, CAD and visualisation professional now has a wider and more competitively priced choice of imagery than ever before whatever their application.

The GIS, CAD and visualisation professional now has a wider and more competitively priced choice of imagery than ever before whatever their application

This article was written by James Cutler, CEO at eMapSite

www.emapsite.com

Corel Designer Technical Suite 12

Technical illustration is a very different beast to core Design. Corel's latest Designer Technical Suite packs a range of raster and vector illustration tools in a simple to use unified package.

Greg Corke

Product: Corel Designer Technical Suite 12 **Supplier:** Corel **Price:** £454

Corel Designer Technical Suite is not the typical software program we look at in AEC magazine. Rather than providing the tools with which to design, it has been created specifically for technical illustrators; be they in the general manufacturing, automotive, or architectural/landscaping sectors. In short, the suite is designed to enable Technical Illustrators to take an engineering document, in vector or raster format, and re-purpose it to create a new document, which can be easily understood by the untrained eye. For example this could be to create product documentation or marketing materials, to illustrate clearly how machinery should be disassembled for maintenance, how flat pack furniture should be put together, or how buildings should be constructed.

The suite

The £454 package comprises three bundled products - Corel Designer, Corel Photo-Paint and Corel Trace. Corel Designer is a vector-based illustration package, Corel Photo-Paint is used for image editing, and Corel Trace for raster to vector tracing. The Designer and Photo-Paint modules are fully customizable with Microsoft Visual Basic. And this customizability extends to the user interface, enabling technical illustrators to streamline the available tools to match their workflow and quickly tailor the interface menus, commands, shortcut keys, and toolbars.

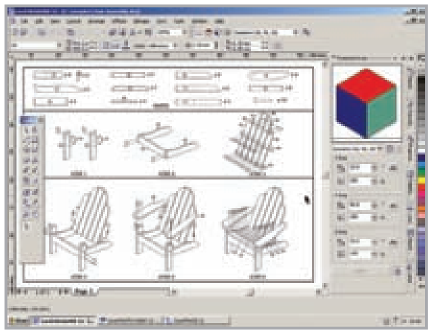
With re-purposing high on the list of tasks, Corel Designer Technical Suite supports more than 75 import/export file formats, including DXF, DWG (up to 2004), SVG, CGM, CDR, PSD, TIFF, AI, EPS, DOC, XLS, and PDF. This last format is a particularly interesting one as users can now publish a drawing to a PDF file that is compatible with Adobe Acrobat 6.0.

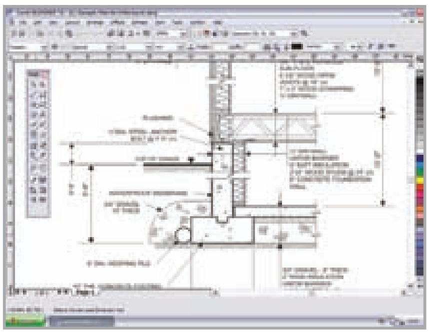
For those needing to work with legacy pen and ink drawings, CorelTrace automatically converts scanned bitmaps into vector images and seamlessly imports them into Corel Designer. We found that the quality of conversion wasn't as good as in dedicated R2V products like Scan2CAD or GTX RasterCAD with less accurate conversion of geometric features, but then the requirements aren't as stringent for technical illustration as they are for traditional CAD work.

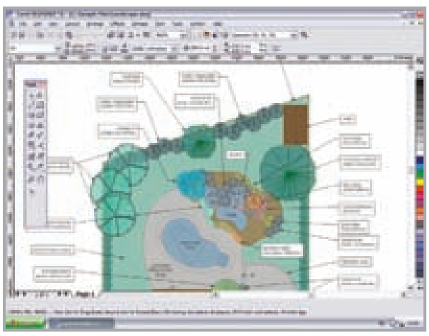
Inside the Designer product, users are presented with a very clean interface. The majority of commands are accessible from the Toolbox toolbar, and these include all the usual line, circle, polygon, curve, ellipse and text creation tools. Imported files can be cleaned up with a combination of the virtual segment delete, eraser or knife tools, which in combination make for a very effective way to knock drawings into shape. Additional geometry can be added quickly with all the creation tools working fluidly with the essential Gravity Snapping tools, which include all the usual node, intersection midpoint, quadrant, etc. You can make gravity candidates active or inactive and set other options to customize snapping. These can be used in conjunction with the system's dynamic guides, which are temporary guidelines users can pull from snap points in objects. Users can also display dynamic guides that are tangent, perpendicular, or parallel to objects. Once created, all objects, lines, circles and polygons can be easily edited by simply dragging their handles.

In addition to two-dimensional drawings many technical illustrations are best communicated in 3D. Here, Corel Designer's new projected drawing modes enable users to actively draw on a projected plane, be it in isometric, trimetric, etc. Users can also project a 2D object onto a drawing plane.

Key aspects to all technical illustrations are detailed annotations, callouts and measurements. These items may include information about product part numbers, links to other drawings, and descriptions of functionality. Corel Designer provides enhanced tools for creating and modifying callouts and dimension lines, with simple or advanced options. For example, adding a halo to a callout creates a user definable mask behind the leader line, which makes it easier to see call-outs on top of other objects. Dimensions styles can also be applied easily and remain fully associative should objects change.







<< CAD drawings can be brought to life with raster colour fills and callouts.

In order to give drawings a distinct style, a number of line types are available which allow technical illustrators to create lines of a specific width and pattern. A variety of hatch fills, vector fills, and raster fills, are also available to bring your drawing to life, and hatch fills can be automatically imported from AutoCAD, though we didn't verify the quality of this feature.

Corel Designer also includes more than 4,000 industry-standard architectural, mechanical and electrical symbols. These are vector-based and users can automatically update all references to a symbol in a single drawing should it be edited.

Conclusion

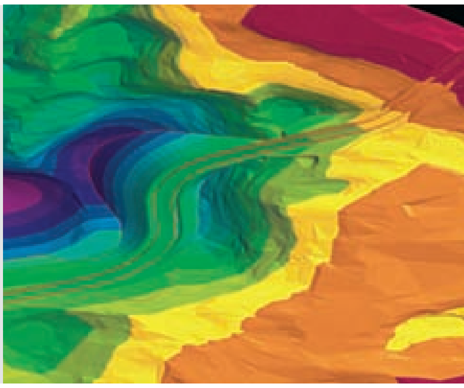
Corel Designer Technical Suite can't be faulted for depth of functionality. The Designer module at the heart of Suite looks to be a very slick tool for those wishing to re-purpose CAD drawings into a form that is more visually appealing and easily understood by the layman; after all, CAD output is great for engineers, but put a third angle orthographic projection in front of Joe Public, and you'll probably see his eyes glaze over.

> "The Designer module looks to be a very slick tool for those wishing to re-purpose CAD drawings into a form more visually appealing and easily understood by the layman"

In addition to the full complement of vector manipulation tools, users get raster image editing with Photo-Paint and raster-to-vector conversion with Corel trace. While these products are likely to play second fiddle to the core Designer module, they round off the suite nicely and more than justify the £454 price tag. It's also worth mentioning that Corel is offering competitive upgrades from Microsoft Visio and AutoCAD LT, which at £194 could well be worth investigating, particularly if you've got a redundant seat floating around.

www.corel.com







MyVR — visualisation over the web

Distributing CAD models to potential customers or manufacturers has become a highly competitive market. A new solution from Norway, offers a way to distribute photorealistic 'VR' sessions of models over the web.

Martyn Day

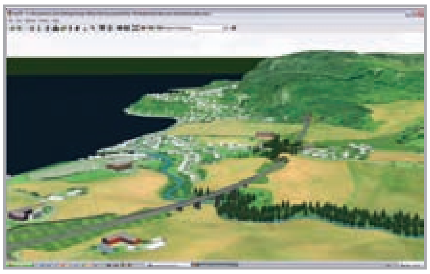
Product: MyVR **Supplier:** 3D to Go **Price:** see text

There are a number of real time visualisation systems on the market today which enable the viewing of Architectural or Mechanical models. These could be a simple as sending an executable, like SolidWorks eDrawings or as powerful as building a complete 3D environment in a product like NavisWorks. With the advent of the Internet there have been many other solutions which utilise light-weight formats, Java or other devices to distribute design information but none have really cornered the market yet.

An exciting new venture in this space comes from Norway and is called simply, MyVR, and in the UK the product is sold through a company called 3DtoGo. In short, MyVR provides a series of tools to distribute interactive, real-time, VR sessions of large models over the web. The quality of the rendering is photorealistic and even though the models are streamed over the web, the interactivity is as if you are looking at the model on your hard drive. The concept behind the product is that firms that create 3D models will be able to store especially thinned out versions of these models on a server, which will stream sessions over the web for potential customers to walkthrough, interact and visualise buildings, landscapes or products – before they are built or manufactured. The developers claim that MyVR could even be used for training or as a virtual front end to shopping. While the streaming over the web is played heavily on, the VR environments can also be run from local hard drives, or across a network.

To use the product, one obviously has to have 3D content to start with. 3DtoGo realises that many firms may not have made the switch to developing full 3D models and so offer a service to generate 3D models from 2D plans or drawings. Those companies that are using either Autodesk's 3D Studio or Viz product will have a head start, as at the moment MyVR works with data created exclusively in those systems, although other key industry applications are currently being considered. Environments created in Max or Viz are the key start point, as MyVR takes the polygon models, textures and lighting from the software.

MyVR is actually made up from a number of modules, each of which have a specific in the process of making, distributing and viewing the models. MyVR Export is the Max/Viz component which takes 3DS files and runs special algorithms to 'thin out' the file size. Typically 3DtoGo claims that model size reduces by 50% to 75%. In one of the demo files, an 800MB model shrank to just 131MB. In the general scale of the web, 131MB is still a very large file to stream but this is where 3DtoGo feel its technology has an edge.

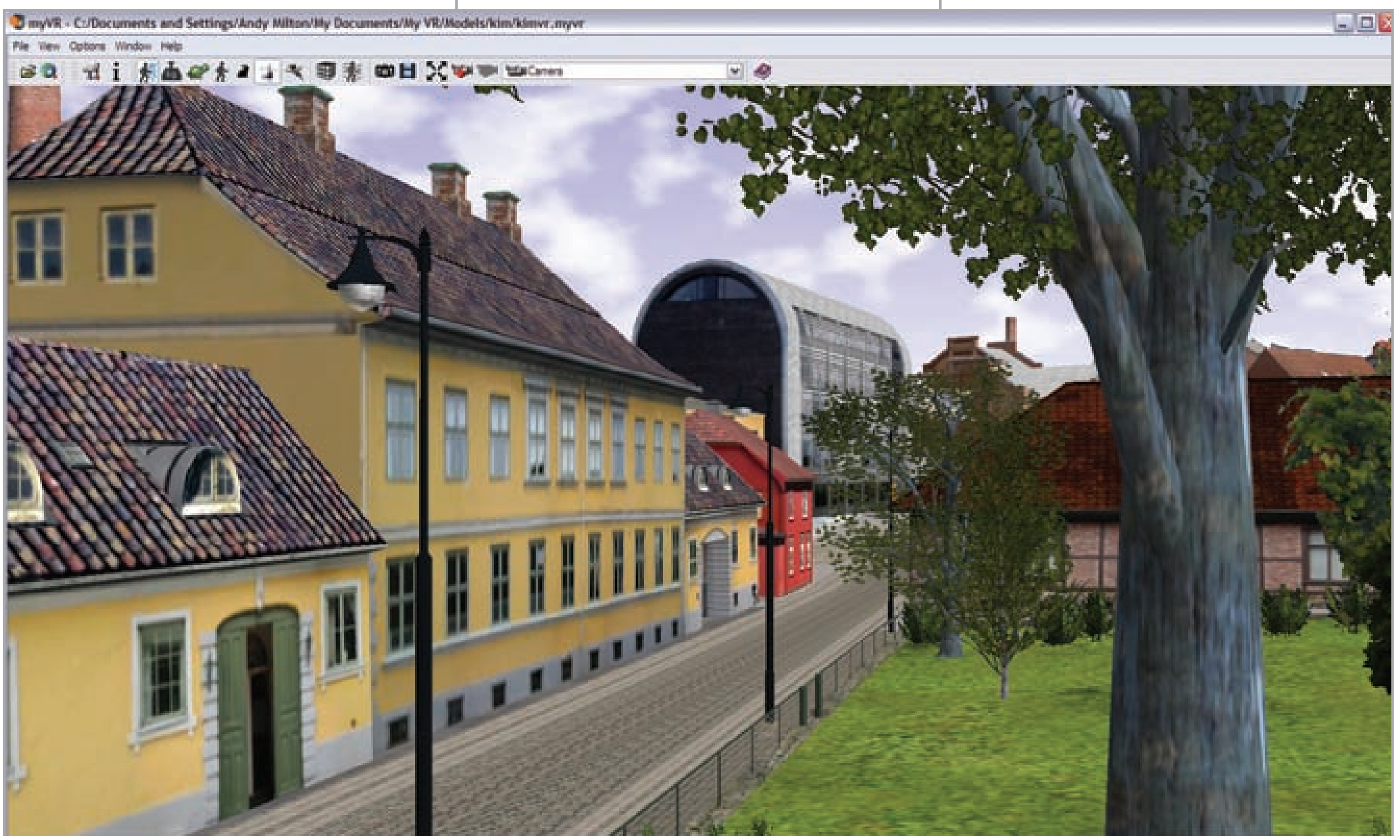


Once the MyVR file has been created, it's loaded onto the MyVR realtime server, ready for distribution. The MyVR Publisher component then allows administrators to allocate rights and settings for access to the models, adding additional control like passwords. Once in the MyVR format, the data is encrypted and cannot be modified by a viewing client, if streamed, it also cannot be stored (stolen) on a PC as it only occupies Video memory on the graphics card.

The final part of the product is a viewing application, which comes in three flavours; a freely downloadable viewer, an Active X component for embedding into company websites and a 'Pro' Viewer, which provides the ability to generate walkthrough paths, AVIs and set up cameras (which can also be extracted from Max/Viz).

Viewing

As you will be able to tell from the images, the quality of the output is pretty good, as good as you'd get within 3D Studio. Loading files from a local hard drive takes only a few seconds, while downloading the initial set-up over the



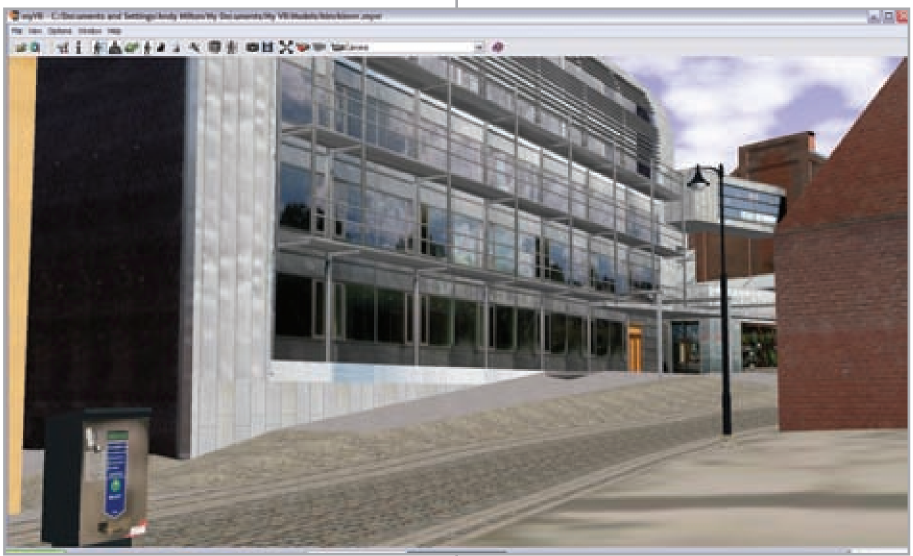
Internet, the initial download is around 4MB, which may take a few minutes over standard broadband. To move about the model you can chose to walk (3 speeds), fly (helicopter) or Fly around at Jet speed! All of which provide smooth graphics, as if it were a game (for those of you that have played Half Life, it's pretty similar). Clash detection can be switched on, so you can't pass through walls, or more importantly, when the gravity button is hit, you don't go through the floor! Fog can be applied to add a little atmosphere, the clouds move and with a good Max model, animations like water movement will be displayed.

Moving about is simple, left mouse button forward, right back and moving the mouse allows you to look around. Scenes can be saved with a number of set camera views, which you can flick through, or go back to should you get lost in your model, which is possible. The product supports paths, so it's also possible to fly along pre-determined paths, like a road, or a route around a product or house. If models are animated in Max, it's also possible to have moving mechanisms within an environment.

The only pre-requisite to run a MyVR session is that your PC has an OpenGL capable graphics card, which to be honest has been standard in most machines for a number of years.

Conclusion

With visualisation tools, the proof of the pudding is in the quality of the images. I think you can tell from these screen grabs that the quality is certainly there. Obviously the magazine medium isn't great at showing moving images, but I was impressed in the frame rate and smoothness of MyVR, as well as its simplicity.



The sales model for the product is a tad more complex. To own the technology outright, costs £20,000, and this includes the export, server and a 'Pro' viewer. Here you can make as many models as you want and host the service on your own server and embed MyVR sessions into your website This obviously limits the product to larger firms. However, MyVR is available as a service from 3DtoGo, with the company hosting the model on its servers and charging a monthly fee for a set number of 'streams' (client web sessions). Also, for those that don't have the in-house 3D capability, the company offers a Max/Viz modelling service. Alternatively, the web portion could be avoided and MyVR environments could be sent to clients on a CD with the viewer.

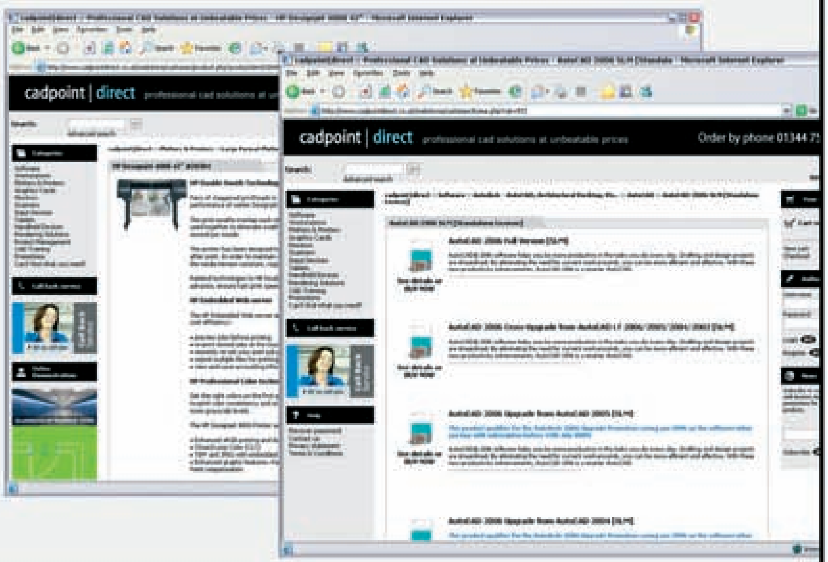
The end results are very impressive and guaranteed to wow clients. Obviously with the fixed cost or ASP payment model, the value of distributing the model to clients or potential clients has to be weighed up. By paying per stream, you'd really want only qualified customers to view your designs. While if you opted to buy MyVR, the cost of opening up sessions to everyone will be based on what you pay your provider for bytes transmitted. To launch MyVR in the UK, 3DtoGo is offering a month's free hosting for the first 25 AEC customers that want to evaluate the technology. A demonstration of the streaming technology is available as a download from the company website.

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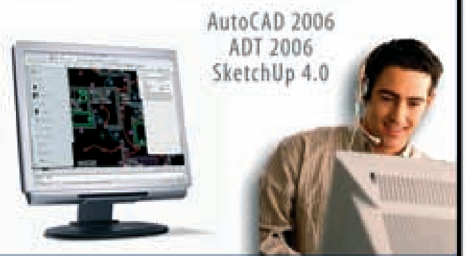


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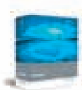
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Dual core and input devices

Robert Jamieson

In the latest installment of his series of articles on PC workstations, Rob Jamieson looks at what dual core processors – the latest in CPU technology – mean for CAD, and how important it is to use a good quality keyboard and mouse.

Dual-core microprocessors contain two processor cores on a single piece of silicon, giving workstations improved multitasking capabilities.

The current hot topic in the mainstream computer press at the moment is the new dual core processors from AMD and Intel, but are they any good for CAD? Both manufacturers are targeting you as the audience for some of these chips but will they make a difference to your application?

So what is dual core, don't we have dual CPU systems already? Dual CPU systems are based on a single core with two or more physical CPUs. These would be called a Xeon or Opteron. Dual core is where two CPUs are on a single chip or die and directly connected together. They appear to the Operating System (OS) as two CPUs even though there is only one physical chip. So why do we need them?

It's not so much a case of why do we need them but that it's likely to be the only choice in the near future. To make CPUs go faster they have been reducing the size of the transistors – with 90 nanometre currently being used in the new Intel Pentium D. At this small scale and below, physical properties of electrons change and have been causing problems mainly with producing excess heat. This has then led to Intel cancelling the P4 4GHz and a scramble between AMD and Intel to launch dual core early. All dual cores support 64-bit code.

Dual core is set to replace all standard high performance processors whether it is currently single, dual with or without hyper threading. Just to remind you hyper threading is referred to as two logical processors and was used in Xeon and some P4s to execute two tasks at once. Not a separate core but it could maintain two separate architectural states and separate Advanced Programmable Interrupt Controllers (APIC) which provides multi-processor interrupt management and incorporates both static and dynamic symmetric interrupt distribution across all processors! Err…in plain English you can do an intensive task (update a model) and a light task (browse the web) at the same time. Running two intensive tasks on single hyper threading chip would often give you a long wait.

AMD and Intel have two completely different launch strategies. Intel is launching a Dual Core P4 called the Pentium D and a Pentium Extreme Edition (PEE) with two cores each with hyperthreading. So Intel is currently targeting the single P4 market and will be launching the Dual Core Xeons later. AMD is launching Dual Core Opterons, which is the multiple processor market first, and Athlon 64 2X soon (June 2005).

Intel is targeting the PEE at CAD and high performance users i.e. you! Your OS will see four logical processors with just one physical chip. The launch speed for this chip is 3.2GHz, but how does this compare with the current P4 3.6GHz or 3.8GHz? As most applications today don't understand how to use two processors at once (including your CAD application) it will run slower on the first multi-core chips until the clock speed increases.

As I said last issue the software developers are looking to develop multi-threaded applications but it will take time and



is hard to develop for. If you split a bit of code to run on two processors at once, one of these threads might finish first. This thread would have to wait for the second thread to finish before moving onto the next task. Rendering applications have been multi threaded for a while as you just split the screen up and render each bit of area on a virtual processor.

I had a look at AMD's Dual Core Opteron and compared it to a 3.6GHz P4 EMT64. A strange comparison but I was doing it from the view of one of you reading this and I was using a design application rather than raw multiple processing performance. Armari, one of the UK launch partners for AMD, built a machine with one dual core processor and then added a second and I ran some basic tests. There are lots of factors that can affect performance but I was concentrating on CPUs and how it relates to CAD so I didn't check loading speed (hard disk performance) etc.

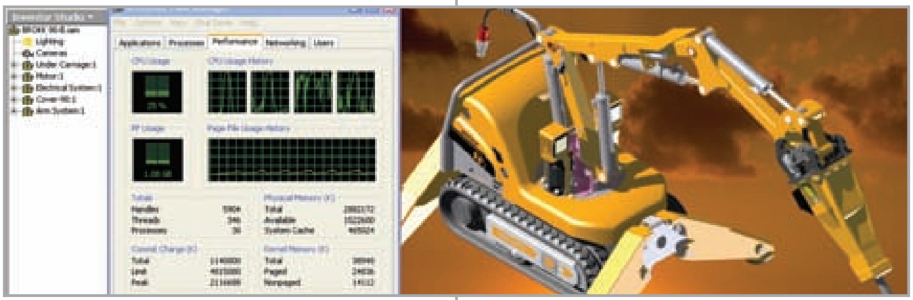
The first test I looked at was rendering a still image in 3dsmax. The "single" 2.2 GHz Opteron was faster than the P4 by 18%. Looking at the task manager both the P4 with its hyper-threading and the Single Dual Core Opteron appeared and used 2 CPUs. Adding the second Opteron didn't decrease the render time by much (6%) but this was due to the "scene" being a slab sided truck and not having many reflective surfaces etc. Armari stated you need a reasonably complex and/or large model to push the use of the multiple CPUs, which rings true from what I've seen before.

Rebuilding of a solid model was very close in time on the P4, Single Dual Core Opteron and Dual, Dual Core Opteron (that's a mouthful). This just goes to show the solid modellers are not yet multi-threading.

The next test was interesting for me and measured over a 100 frames rotation of the same model in Inventor 10, a 3D solid modelling package for mechanical engineers. Both the P4 and Opteron had FireGL V5000 PCI Express graphics card in but the one in the Opteron was 9% faster. Under more demanding tests I think this would »



« AMD will be targetting the dual processor market first with its dual core Opterons.



Rendering in Inventor Studio: Windows task manager shows 4 processors in a dual core, dual processor Opteron workstation.

be larger. This is not showing any advantage of dual core but more on the architecture of Opteron helping graphics cards. Expect to see a lot of graphics card performance figures on Opterons very soon in any magazine you read!

The last test I did was using the render in Inventor (hey I only had the afternoon, it takes a lot of time installing software). This was a typical 3,000 part assembly with basic lights etc. The Opteron single or dual was faster by 10% even though the extra processors are visible on the screen (a little render box appears per processor). This shows the Inventor renderer supports multiple processors and more than two which surprised me, but for basic "model" rendering it can't split it up enough to utilise the extra processing power. If you are doing analysis or rendering complex scenes it looks as if AMD is onto a winner.

Dual Core Opterons work with existing motherboards with a bios update so as soon as the CPUs become available you can buy one. Microsoft is withdrawing support from Intel's Itanium as too few have been sold and customers are giving them back so it just goes to show how Opterons are affecting the big blue (Intel) on sales. On the single CPU Dual core things are a little different. If you want to buy one you will need a new motherboard with 955 chipset on in the Intel camp. I haven't tested one but if the launch one is only 3.2GHz it's not going to be as fast as a current P4 3.6 or 3.8 for single threaded applications as it's just two P4s bolted together. The next generation will be based on two Pentium M cores which is likely be a killer in performance. As they increase the clock speed the Pentium D will be an interesting price performance winner, perhaps with volumes it is likely to ship. There will need to be some intensive tests done to see if two cores on one chip is faster that two CPUs in the old Xeon arrangement. Even though most of the software is not multi threaded the fact you can do two things at once (a faculty my wife says she has and I don't) can be very useful! Thanks to Armari (***www.armari.co.uk***) for allowing me to bug them all afternoon and the use of their kit.

It's all well and good having cutting edge workstation technology, but without the right devices to drive your CAD system you still won't be achieving optimum productivity.

The physical connections to a computer are used intensively but are often overlooked when setting up your workstation. The standard mouse and keyboard shipped with workstations can be of low quality, but these peripherals can have a big effect on your working environment. For a little cost both comfort and productivity can be increased as long as you select the right equipment.

I'm going to concentrate on the mouse and keyboard as well as some of the other input devices that you use to get your work done. The original connection was by a 5-pin Din plug for the keyboard and a serial cable for the mouse. Then PS2 type connectors (from IBM PCs) were adopted. PS2 type connectors are physically smaller and are still present on most PCs today.

In recent years USB (Universal Serial Bus) mouse and keyboard connections have been introduced. USB is faster than PS2 and offers extra functionality. A converter can be used to connect a modern USB mouse to the older PS2 port, but you may find that some of the features are not recognised, for example the rollerball function. If you use a USB keyboard on your workstation when you reinstall the operating system it might not see the keyboard as a device until the USB driver is installed, which means you won't be able to type anything into the system! This is not a problem if the OS is preinstalled but it's always handy to keep a PS2 keyboard if you are reinstalling or doing major surgery to your workstation. XP 64-bit loads a USB driver directly so this will not be a problem in the future.

Today a keyboard can be purchased for as little as £3 and goes up to around £80. I remember the days when they were all relatively expensive and part of my job was to clean the cheese sandwich crumbs left by draughtsmen out of the keyboard tray. I did this by taking all the keys off – not a quick job – but in those days to replace a keyboard was considered an unnecessary expense.

So what type of keyboard should I get? I'm not one for the split keyboard style so am not going to comment on this type but would recommend that whatever style of keyboard you choose you make sure you spend a little more on a keyboard with some sort of quality. Most OEM keyboards are ok but for those of you building your own workstation system I'd recommend getting a Microsoft or Logitech keyboard with a good palm rest. A lot have configurable functions and shortcut keys and should cost around £20 with a PS2 connection. If you do decide to use a USB keyboard then plug it into the workstation directly and don't use an external USB hub. The reason for this is that when a system starts it may need to load a separate USB hub driver but sometimes does not recognise this and so doesn't recognise the keyboard but then you can't type anything to sort the problem!

The mouse

Now ever since I started my CAD career – using a puck with DOGS – I've always been quite fast with a mouse and very picky with what I like. Most designers, draughtsmen, illustrators etc are the same and demand a mouse with quality as it's considered the pencil of the modern world. At the base level the humble Microsoft ball mouse is now hard to get (I've also spent many a year cleaning the rollers next to the balls with a little penknife!). In my view the Microsoft IntelliMouse Optical is a good base level mouse. It is a corded mouse, costs around £10 and is ok, although in intensive use I tend to find some minor tracking errors – you think you have clicked something and you look on the screen and you haven't.

A useful feature is to configure the middle button to work with your CAD application's zoom feature, such as in AutoCAD etc. The next step up is to use a "gamers" mouse, such as the Raptor Gaming M1 Mouse. These have better optical sensors and can track up to a higher level DPI (dots per inch). I tend to get better accuracy with this type of mouse but the setup interface can be "interesting". They are also useful for after hours "fragging" or playing one of the many first person shooting games. This sort of mouse starts at around £20 and are good for left handers as they are a symmetrical shape. A specialist, such as Scan Computers has a full range available.

The next stage up from this is the Microsoft Wireless IntelliMouse Explorer range, which are cordless and need batteries. This type of mouse uses radio to transmit location information (infra red is now past its sell by date), has excellent tracking ability and is the one I use for creative work and on a day to day basis. They cost around £35.

> Most designers, draughtsmen and illustrators demand a quality mouse – it's the pencil of the modern world

There are two downsides – it is designed for right handed people only and the setup software made getting the rollerball to appear as a middle button very hard. Most zooms on 3D CAD software look for this to set as a middle button for the double click for zoom all etc.

The top dog for mice is the Logitech MX 1000 Laser. It combines supreme tracking with comfort and has never missed a beat. It comes with its own charging dock (not good if you move your PC a lot as a demo jock – aka application engineer). At around £40 it's very good value and I don't want to give it back! But just like the Wireless IntelliMouse it is designed for right hand use only.

There are presentation mice and keyboards from the Gyration Ultra range which have long wireless range. I've not used one in anger but it from a quick play it was good – a set starts around £70.

Robert Jamieson works for workstation graphics specialist, ATI. ***rjamieson@ati.com***